



IMPERIAL AGRICULTURAL
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FLORA OF GUATEMALA

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CONTENTS

Families Included in Part V

	PAGE		PAGE
Leguminosae.....	1	Zygophyllaceae.....	393
Geraniaceae	368	Rutaceae ..	398
Oxalidaceae	374	Simaroubaceae.....	425
Tropaeolaceae.	385	Burseraceae.....	434
Linaceae.....	387	Meliaceae.....	444
Erythroxylaceae.....	390	Malpighiaceae.....	468

LEGUMINOSAE. Bean Family

References: N. L. Britton and J. N. Rose, Mimosaceae, N. Amer. Fl. 23: 1-194. 1928; Caesalpinaceae, N. Amer. Fl. 23: 201-349. 1930. P. A. Rydberg, Fabaceae, N. Amer. Fl. 24: 1-462. 1919-1929.

Trees, shrubs, or herbs, various in habit, sometimes scandent, often armed with spines or prickles; leaves stipulate, alternate or rarely opposite, mostly pinnately or digitately compound or bipinnate, the leaflets few or numerous, small or large, entire, lobate, or rarely dentate, sometimes stipellate; flowers mostly irregular and perfect, or regular and polygamous, the peduncles axillary or terminal, 1-many-flowered; pedicels solitary, geminate, or fasciculate, usually in the axis of a bract; bractlets usually 2 at the base of the calyx; sepals in the irregular flowers usually 5, sometimes 4, united to form a variously dentate or lobate calyx, or sometimes free, imbricate or valvate; sepals in the regular flowers usually 5, sometimes 3-6, connate or free; irregular flowers similar to those of the bean (*frijol*), the petals 5 or by abortion sometimes fewer, very unlike in form, the uppermost (*standard*) usually larger than the others, the 2 lateral ones (*wings*) narrower, and the 2 lowest (forming the *keel*) usually still smaller and often united; petals in the regular flowers as many as the sepals; stamens generally twice as many as the petals, rarely as many as the petals, sometimes fewer or numerous, hypogynous, or usually inserted on the margin of a disk adnate to the calyx, free or connate; anthers 2-celled, the cells parallel, opening by longitudinal slits or rarely by terminal pores; pistil 1-carpellate, excentric, 1-celled; style simple, continuous with the margin of the ovary, entire or with a small tooth at the apex; stigma entire, terminal or lateral and introrse below the apex of the style, rarely extrorse; ovules numerous or rarely 1, inserted along the inner angle of the ovary in 1-2 series, transverse or ascending; fruit a legume, typically similar to a bean pod, but often very greatly altered, usually dry, sometimes pulpy within, rarely drupaceous, most often 2-valvate but often indehiscent, continuous within or septate; seeds 1-many, affixed along the upper suture of the fruit; funicle often expanded to form a fleshy aril; endosperm usually scant or none, rarely copious; cotyledons usually flat and foliaceous or thick and fleshy, the radicle superior, rarely inferior, straight, oblique, or inflexed.

A vast family, with about 500 genera and more than 12,000 species, represented in all parts of the earth. A very few additional genera are found in other parts of Central America. The Leguminosae constitute one of the most natural of families, recognizable as a rule by their foliage and fruit. They include many of the most valuable members of the plant kingdom, especially useful for food and wood. Some botanists divide the family into three, Papilionaceae or Fabaceae, Mimosaceae, and Caesalpinaceae, but most authors maintain the group in its historic sense, as here employed.

Probably no key to genera of Leguminosae that ever has been prepared is wholly satisfactory, since in almost every group there are exceptions to the characters on which the groups are based. In some tribes, particularly Phaseoleae and Dalbergieae, the genera are based on difficult and variable characters, which often make the generic position of species uncertain. In other tribes, however, the genera are sharply marked.

Flowers regular, the petals equal or nearly so; petals valvate in bud, generally united near the base; stamens distinct or united; leaves usually bipinnate, pinnate in *Inga* and a few species of *Pithecolobium*. I. Mimosaeae.

Flowers more or less irregular, usually conspicuously so; petals imbricate in bud. Upper petals within the others in bud; stamens usually distinct; leaves bipinnate or pinnate, rarely simple. II. Caesalpinieae.

Upper petals exterior in bud; stamens usually united; leaves never bipinnate. III. Papilionatae.

I. MIMOSEAE

Leaves pinnate. *Inga*.
Leaves bipinnate.

Anthers tipped with a small gland (this often easily detached).

Flowers capitate; unarmed herbs. *Neptunia*.

Flowers spicate; shrubs or trees, sometimes scandent, usually armed with spines or prickles.

Valves of the fruit separating at maturity into 1-seeded joints; woody vines. *Entada*.

Valves of the fruit continuous; plants not scandent.

Legume septate between the seeds, indehiscent. *Prosopis*.

Legume not septate, 2-valvate. *Piptadenia*.

Anthers eglandular.

Stamens as many as the corolla lobes or twice as many.

Margins of the legume persistent, the valves separating from it; flowers capitate or spicate.

Valves very narrow, scarcely as wide as the thickened margin, continuous. *Schrankia*.

Valves of the legume usually much wider than the margins and breaking up into joints. *Mimosa*.

Margins of the legume not separating from the valves; flowers capitate.

Seeds longitudinal or oblique; herbs, sometimes suffrutescent at the base. *Desmanthus*.

Seeds transverse; trees or large shrubs. *Leucaena*.

Stamens numerous, more than twice as many as the corolla lobes.

Stamens free; flowers capitate or spicate; plants armed or unarmed. *Acacia*.

Stamens united at or often far above the base.

Legume elastically 2-valvate; plants unarmed; flowers capitate.

. *Calliandra*.

Legume not elastically 2-valvate.

Valves of the fruit very thin, separating from the persistent margins; plants unarmed; flowers spicate or capitate. *Lysiloma*.

Valves of the fruit often thick, not separating from the margins.

Valves of the legume thin, straight, broad, never contorted; plants unarmed; flowers capitate or umbellate.....*Albizia*.

Valves of the legume thick, often ligneous or coriaceous, often coiled or contorted.

Legume broad, coiled, strongly compressed; unarmed trees; flowers capitate.....*Enterolobium*.

Legume various, but not forming a flat coil; shrubs or trees, often armed with spines or prickles; flowers capitate or spicate.
Pithecolobium.

ACACIA L.

Trees or shrubs, unarmed or usually armed with spines or prickles; leaves bipinnate, the leaflets mostly small and numerous, sometimes reduced to a leaf-like petiole (phyllode); petiole usually bearing a gland; stipules often spinescent and large, or small and inconspicuous; flowers small, 4-5-parted, generally yellow, in globose heads or umbels or cylindric spikes, the peduncles axillary and solitary or fasciculate, or in terminal panicles; calyx campanulate, dentate or lobate; petals more or less united, rarely free; stamens numerous, sometimes 50 or more, free or nearly so, the anthers small; ovary sessile or stipitate, 2-many-ovulate, the styles filiform, the stigma small, terminal; legume highly variable in form, ovate to oblong or linear, terete or compressed, straight or variously curved or contorted, membranaceous to ligneous, 2-valvate or indehiscent; seeds transverse or longitudinal, usually ovate and compressed.

Species probably 500, widely distributed, most plentiful in tropical America, Africa, and Australia. A few besides those listed here are known from other parts of Central America. Britton and Rose in *North American Flora* scatter the species among 12 genera, a few of which really can claim recognition as distinct groups.

Branches armed with stipular spines, these present only at the nodes, often greatly enlarged and hollow.

Spines small or at least slender, straight, solid, not hollow; flowers capitate.

Pinnæ many pairs.....*A. pennatula*.

Pinnæ 2-8 pairs.

Legume and leaflets pubescent.....*A. tortuosa*.

Legume glabrous, the leaflets glabrous or nearly so.....*A. Farnesiana*.

Spines very large, usually hollow, usually punctured by ants, often twisted or contorted and suggestive of the horns of a bull.

Flowers capitate; legume compressed, dehiscent.....*A. Cookii*.

Flowers spicate; legume compressed and dehiscent or terete and indehiscent.

Legume terete, indehiscent, terminated by a long, sharp, spine-like beak; flower spikes oblong, very dense, the rachis thick.

Spines strongly compressed, concave on the upper surface, with thin acute edges; legume attenuate at the apex.....*A. mayana*.

Spines terete; legume abruptly contracted into the terminal spine.

A. spadici-gera.

Legume more or less compressed, dehiscent along one or both sutures, with a short beak or none; flower spikes oblong or linear, dense or lax, the rachis thick or often very slender.

- Legume opening along the ventral suture only; spines often united for half or more of their length, the united portion strongly compressed and broad; bractlets of the spikes not peltate, the spikes elongate, rather lax, slender-pedunculate. *A. Hindsii*.
- Legume opening along both sutures; spines mostly united only at or near the base, elongate and terete, the united portion not conspicuously compressed; bractlets peltate or not, the spikes oblong or elongate, usually very dense.
- Bractlets not peltate; involucre inserted on the peduncle above the middle. *A. hirtipes*.
- Bractlets peltate, at first hiding the flower buds; involucre inserted below the middle of the peduncle.
- Legume strongly compressed, long-stipitate, 20 cm. long or longer; leaflets 3-nerved at the base. *A. Gentilei*.
- Legume only slightly compressed, 4-6 cm. long, sessile or nearly so; leaflets 1-3-nerved.
- Leaflets 3-nerved at the base, thick. *A. costaricensis*.
- Leaflets 1-nerved, thin. *A. Collinsii*.
- Branches unarmed or aculeate, the prickles scattered along the branches between the nodes, always small.
- Flowers pedicellate, in head-like umbels or very short, oblong racemes; petiole eglandular; branches unarmed.
- Margins of the leaflets conspicuously revolute. *A. polypodioides*.
- Margins of the leaflets not revolute. *A. angustissima*.
- Flowers sessile, capitate or spicate; petiole usually bearing a gland; branches often aculeate.
- Flowers in elongate spikes.
- Leaflets obtuse. *A. dolichostachya*.
- Leaflets acute. *A. centralis*.
- Flowers in dense globose heads or in very short, oblong, head-like spikes.
- Leaves (phyllodes) simple. *A. neriifolia*.
- Leaves bipinnate.
- Costa of the leaflets strongly excentric, close to the upper margin.
- Plants tall trees, the branches mostly unarmed; flowers capitate; petiole bearing a single gland. *A. glomerosa*.
- Plants woody vines, the branches aculeate; flowers in very short spikes; petiole bearing numerous glands. *A. acanthophylla*.
- Costa of the leaflets central or nearly so.
- Legume glabrous; leaflets 1-nerved. *A. Deamii*.
- Legume pubescent; leaflets with remote veins divergent from the costa. *A. riparioides*.

Acacia acanthophylla (Britt. & Rose) Standl. Field Mus. Bot. 18: 488. 1937. *Senegalia acanthophylla* Britt. & Rose, N. Amer. Fl. 23: 118. 1928.

Reported by Britton and Rose from Guatemala, the locality not indicated. Chiapas; Costa Rica.

A large woody vine, the branches glabrous, armed with numerous recurved prickles; petiole and rachis pubescent, bearing numerous elevated glands; pinnae 8–15 pairs; leaflets many pairs, 8–10 mm. long, 2 mm. wide, oblique, acute, glabrous above, glabrous beneath except along the costa, this excentric, the margins ciliate; flowers in short spikes, the spikes paniculate; calyx and corolla glabrous; legume 15–20 cm. long, 3 cm. wide, flat.

Acacia angustissima (Mill.) Kuntze, Rev. Gen. 3, pt. 2: 47. 1898. *Mimosa angustissima* Mill. Gard. Dict. ed. 8. no. 19. 1768. *M. filicioides* Cav. Icon. Pl. 1: 55. pl. 78. 1791. *Acacia filicina* Willd. Sp. Pl. 4: 1072. 1806. *A. filicioides* Trelease, Rept. Ark. Geol. Surv. 1888, pt. 4: 178. 1891. *A. angulosa* Bertol. Fl. Guat. 442. 1840 (type from Volcán de Agua, Velásquez). *Acaciella angustissima* Britt. & Rose, N. Amer. Fl. 23: 100. 1928. *Acaciella angulosa* Britt. & Rose, loc. cit. *Acaciella Rensonii* Britt. & Rose, op. cit. 101. *Guajito*; *Sere* (Jutiapa); *Guaje*; *Chali* (Volcán de Agua); *Barbasol*; *Barretillo*; *Yoca* (Chiquimula); *Timbre* (Huehuetenango); *Plumajillo*; *Huaj*; *Ninté* (Huehuetenango).

Mostly on rather dry, often rocky, brushy slopes or in thin forest, frequent in pine-oak forest, sometimes in hedges, 2,700 meters or lower; Petén; Alta Verapaz; Baja Verapaz; Izabal; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Sololá; Retalhuleu; Quezaltenango; San Marcos; Huehuetenango. Southern United States; Mexico; Honduras and Salvador to Costa Rica.

Commonly a shrub of 2–3 meters, sometimes a tree of 7 meters or more with rounded crown, unarmed, the branchlets glabrous to short-hirsute; petiole eglandular, the pinnae 6–12 pairs or more; leaflets numerous pairs, linear, 4–7 mm. long, acute or obtuse, usually ciliate, glabrous or somewhat pilose or puberulent, 1-nerved, the margins plane; flowers white, in globose head-like umbels, the peduncles axillary and in terminal racemes or panicles; legume oblong, 4–8 cm. long, glabrous, acute to rounded at the apex, glabrous or sparsely pubescent, usually 8–12 mm. wide, the valves very thin, flat.

Called “guajillo” in Salvador; “xaax,” “cantemo,” “cantebo” (Yucatan, Maya). A common, rather weedy shrub in many regions of Guatemala, often in second growth. The treatment of the *Acacia* species of this alliance (genus *Acaciella* of Britton and Rose) has been considered “difficult,” but only, it seems, because attempts have been made to recognize too many species. Britton and Rose recognized 49 species of their genus in North America, of which one-third may be distinct. Their numerous other species are to be relegated to synonymy under *A. angustissima*. Examination of their key shows that they used characters of little or no importance

for separating the various forms, and with recent ample collections of the group it is obvious that the supposed characters do not hold. However, if most of the recently described species are reduced to synonymy, we have one not very variable and easily recognized species. The group has been studied recently by Wiggins (*Acacia angustissima* (Mill.) Kuntze and its near relatives, Contr. Dudley Herb. 3: 227. 1942), who recognizes *A. angustissima* with several varieties. He, however, treats *A. filicioides* as a species distinct from *A. angustissima*. The characters upon which he separates these two do not hold in the material we have studied.

Acacia centralis (Britt. & Rose) Lundell, Contr. Univ. Mich. Herb. 4: 7. 1940. *Senegalia centralis* Britt. & Rose, N. Amer. Fl. 23: 113. 1928.

Dry brushy hillsides, 180 meters; Zacapa (near Gualán, C. C. Deam 6281, 6282). Salvador, the type collected near San Salvador.

An unarmed tree about 6 meters high, the branchlets puberulent; stipules minute, setaceous, deciduous; petiole short, slender, puberulent, bearing a rather large gland near the middle, the pinnae 12-22 pairs; leaflets numerous pairs, linear-oblong, 2-3 mm. long, acute, falcate, glabrous or nearly so, ciliate; flowers spicate, white, the spikes axillary, shorter than the leaves, short-pedunculate, the rachis puberulent; calyx and corolla minutely puberulent or sericeous; legume unknown.

Called "quebracho" in Salvador. From that country it has been reported as *A. acatlensis* Benth., a closely related Mexican species.

Acacia Collinsii Safford, Science II. 31: 677. 1910 (type from Chiapas). *A. yucatanensis* Schenck, Repert. Sp. Nov. 12: 361. 1913. *Myrmecodendron Collinsii* Britt. & Rose, N. Amer. Fl. 23: 92. 1928. *Cornezuelo*; *Subín* (Petén, Maya).

Brushy plains or hillsides or open forest, 300 meters or less; Petén. Southern Mexico; British Honduras.

A shrub or small tree, usually 5 meters high or less, the branches glabrous; spines inflated and hollow, 3-5 cm. long, terete, attenuate, straight and somewhat ascending, usually broadly V-shaped, shortly united at the base, grayish to dark brown, lustrous, glabrous; pinnae several or numerous pairs; leaflets 15-20 pairs, linear-oblong, 6-8 mm. long, glabrous, obtuse; peduncles axillary, often clustered, very short, the dentate involucre inserted near its base; flower spikes oblong, very dense, the flowers very numerous and densely crowded, the bracts peltate, concealing the flower buds; calyx glabrous; legume only slightly compressed, 3-5 cm. long, 1 cm. thick, dark ferruginous, acute or obtuse, glabrous, 2-valvate.

The Maya name "subín" used in Yucatan and British Honduras signifies "cock spur." Called "torito" in Oaxaca.

Acacia Cookii Safford, Science II. 31: 677. 1910. *Acacia bucerophora* Robinson, Proc. Amer. Acad. 49: 502. 1913 (type from British Honduras, *M. E. Peck* 632). *Myrmecodendron Collinsii* Britt. & Rose, N. Amer. Fl. 23: 92. 1928. *Subín* (Petén, Maya); *Guascanol* (Izabal).

Wet to dry thickets or forest, 850 meters or less; Petén; Alta Verapaz (type from Finca Trece Aguas near Secanquím, Alta Verapaz, *G. P. Goll* 102); Zacapa; Izabal. British Honduras; Honduras.

A shrub or small tree, 9 meters high or less, the branches glabrous; spines hollow, 3–6 cm. long, terete, usually brown or blackish and lustrous, broadly V-shaped, ascending or spreading, glabrous, shortly united at the base; leaves large, the pinnae 14–28 pairs; leaflets many pairs, oblong-linear, 6–7 mm. long, obtuse, glabrous; peduncles short and stout, axillary, densely clustered, very unequal in length in the same cluster, bearing a 3-lobate involucre near the middle; flowers yellow, crowded in very dense, globose heads; legume linear, somewhat compressed, 10–30 cm. long, usually curved, glabrous, dark ferruginous, 2-valvate, sessile, long-attenuate at the apex into a stiff spine-like beak.

Known in British Honduras as “cockspur,” “ant thorn,” and “huascanal.”

Acacia costaricensis Schenck, Repert. Sp. Nov. 12: 361. 1913. *Myrmecodendron costaricense* Britt. & Rose, N. Amer. Fl. 23: 93. 1928. *Subín colorado* (Petén).

Moist or wet thickets or in lowland thickets, 300 meters or less; Petén; San Marcos. Southern Mexico; ranging southward to Panama.

A shrub or small tree, the branches glabrous; spines large, hollow, terete, gray or dark brown, V-shaped or shaped like the horns of an ox, 4 cm. long or less, short-connate at the base, glabrous; pinnae 4–8 pairs; leaflets 14–20 pairs, linear-oblong, 8–10 mm. long, rounded at the apex, glabrous, 3-nerved at the base, at least in age; peduncles short, axillary, often clustered, puberulent, the 3-lobate involucre attached near the base; flowers yellow, in rather slender spikes 3–3.5 cm. long; bractlets peltate, at first concealing the flower buds; legume 3–6 cm. long, little compressed, dark ferruginous, with a long or short beak, glabrous, 2-valvate.

Called “cockspur” in British Honduras.

Acacia Deamii (Britt. & Rose) Standl. Field Mus. Bot. 11: 158. 1936. *Senegalia Deamii* Britt. & Rose, N. Amer. Fl. 23: 117. 1928. *Guaje*; *Yaje*; *Orotoguaje*.

Dry or moist thickets or thinly forested hillsides, sometimes in oak forest or on limestone, 200–2,250 meters; Zacapa (type from

Gualán, *C. C. Deam* 6286); Chiquimula; Baja Verapaz; El Progreso; Jalapa; Huehuetenango. Reported from Honduras.

An unarmed shrub or tree 2-9 meters high, the branchlets puberulent or glabrate; petiole puberulent, bearing a cupular gland near the middle, the pinnae 6-10 pairs; leaflets 20-30 pairs, linear-oblong, 4-6 mm. long, obtuse or rounded at the apex, glabrous above, thinly sericeous beneath, the costa central; flowers probably white, in small dense globose heads, these racemose and often paniculate; peduncles often fasciculate, 6-10 mm. long, puberulent, bracteate near the middle; calyx and corolla glabrous; ovary pilose; legume oblong, glabrous, 9-12 cm. long, 2-2.5 cm. wide, broadly rounded to obtuse and apiculate at the apex, acute at the base and long-stipitate, the valves thin.

The wood is reported as useful for construction purposes. The name "guaje," a term of Nahuatl origin, is given in Guatemala and Mexico to various species of *Acacia* and allied groups. The name of the town of Gualán in Zacapa signifies "place where *guaje* abounds."

Acacia dolichostachya Blake, Proc. Biol. Soc. Wash. 34: 43. 1921. *Senegalia dolichostachya* Britt. & Rose, N. Amer. Fl. 23: 112. 1928. *Quiebra-hacha*.

At 800-900 meters; Huehuetenango (between Santa Ana Huista and Rancho Lucas, *Steyermark* 51338). Yucatan Peninsula of Mexico.

A large shrub or a tree as much as 12 meters high, unarmed, the branches puberulent at first, glabrate in age; petiole bearing a depressed oval gland at about its middle; pinnae 5-11 pairs, the leaflets about 25 pairs, linear-oblong, 3.5-7 mm. long, very obtuse or rounded at the apex, appressed-pubescent or in age glabrate, rather thick; spikes numerous, pedunculate, in anthesis 3-4.5 cm. long, puberulent or glabrate, the bractlets minute, persistent; calyx 0.5 mm. long, puberulent; legume borne on a slender stipe 1.5 cm. long, 9-13 cm. long, 1.3-1.6 cm. wide, obtuse, subacute at the base, glabrous, flat, the valves coriaceous, with conspicuous, elevated, laxly reticulate venation, somewhat lustrous.

Acacia Donnelliana Safford (*Myrmecodendron Donnellianum* Britt. & Rose) is reported in *North American Flora* by Britton and Rose from Guatemala, but the type is really Honduran.

Acacia Farnesiana (L.) Willd. Sp. Pl. 4: 1083. 1806. *Mimosa Farnesiana* L. Sp. Pl. 521. 1753. *Vachellia Farnesiana* Wight & Arn. Prodr. 272. 1834. *Espino blanco*; *Espinal*; *Subín* (Oriente).

Chiefly on dry plains or hillsides, dominant over wide areas of the Oriente and the lower Motagua Valley and elsewhere, often forming dense stands of wide extent, frequent in sandy land along streams, chiefly at 1,300 meters or less; Petén; Baja Verapaz; Zacapa; El Progreso; Chiquimulá; Jalapa; Jutiapa; Santa Rosa; Guatemala; Huehuetenango; Quiché. Southern United States;

Mexico; British Honduras to Salvador and Panama; West Indies; South America; introduced in the Old World.

Usually a shrub of 2-3 meters but sometimes a small tree, densely branched, the branchlets glabrous or nearly so; stipular spines usually white or whitish, slender, 1-5 cm. long; leaves small, the short petiole bearing a small gland, the pinnae 2-6 pairs; leaflets 10-25 pairs, linear or linear-oblong, obtuse, 3-5 mm. long, minutely puberulent or glabrous, the costa almost central; peduncles slender, axillary, 2-4 cm. long, pubescent; flowers yellow, fragrant, in dense globose heads 1 cm. in diameter; legume 2-valvate, dark ferruginous, turgid, straight or slightly curved, glabrous, 4-7 cm. long, 1 cm. thick or more, filled with a sweet pulp.

Known in British Honduras as "cuntich" (Maya) and "cashaw"; "cankilizche," "subinche" (Yucatan, Maya); "aroma," "huizache" (Campeche); "quisache" (Chiapas); "espino ruco" (Salvador). The shrub, usually called "espino blanco," is abundant or dominant over large areas of Guatemala, particularly in the lower Motagua Valley, some parts of the Oriente, and in Quiché and Huehuetenango. It is more or less distinctive in habit, and conspicuous because of the abundant white spines. While the bushes usually are irregular in form, they sometimes are widely spreading and flat-topped, like those of *A. pennatula*. The wood is hard, close-grained, brownish red to yellow, its specific gravity about 0.83. It is employed principally for fuel. The bark and fruit are rich in tannin and are utilized for tanning and dyeing, while the pods sometimes are used for making ink. The leaves and pods are much eaten by stock, which probably aid in diffusion of the seeds. The viscid juice of the pods is useful for mending broken china. The gum exuding from the trunk is similar to gum arabic and is suitable for making mucilage. In southern Europe, particularly about Grasse in France, the shrub is cultivated extensively for its sweet-scented flowers, known in commerce as "cassie flowers," from which perfume is manufactured. It is reported that about Grasse as much as 100,000 pounds of them are harvested annually.

Acacia Gentlei Standl. Field Mus. Bot. 22: 77. 1940. *Cacho de toro*.

Moist or wet forest or thickets, 200 meters or less; Petén; Alta Verapaz; Izabal. British Honduras, the type from some unspecified locality, *Percy Gentle* 185.

A tree, sometimes 15 meters high, the branchlets glabrous or nearly so; spines blackish, terete, hollow, slender, 4-4.5 cm. long, suberect and close together, very shortly connate at the base, glabrous; leaves short-petiolate, the petiole bearing a gland below the apex, the pinnae mostly 3-5 pairs, the rachises puberulent or

pilous; leaflets 9-18 pairs, oblong, 8-13 mm. long, very obtuse, glabrous or nearly so, 3-nerved at the base; flowers yellow, spicate, the peduncles solitary at the nodes; legume linear, on a stipe 2-3 cm. long, 20 cm. long or more, 8 mm. wide, strongly compressed, long-attenuate into a slender spine-like beak, long-attenuate to the base, blackish, glabrous, somewhat striate-veined longitudinally.

Called "cockspur" or "red cockspur" in British Honduras.

Sterile material collected near San Rafael Pétzal, Huehuetenango, where the plant is a common tree along streams, is very similar to *A. gladiata* Safford, having long, narrow, stout, compressed, sword-like spines. The species belongs to the bullhorn group. It is not believed, however, that the Guatemalan *Acacia* can really be this species, which is known otherwise only from the western coast of Mexico.

Acacia glomerosa Benth. Lond. Journ. Bot. 1: 521. 1842. *Senegalia glomerosa* Britt. & Rose, N. Amer. Fl. 23: 116. 1928. *Espino*; *Cantemoc* (Petén, Maya).

Wet to dry forest or thickets, sometimes left for shade in coffee plantations, 600 meters or less; Petén; Alta Verapaz; Retalhuleu; Quezaltenango. Yucatan Peninsula of Mexico; British Honduras; Salvador to Panama; Colombia to Brazil.

A tree of 12-35 meters, with a thick trunk, often with buttresses, the crown broad and depressed, the bark brown or ochraceous, studded with scattered prickles, the branchlets aculeate or unarmed, tomentulose or glabrate; petiole bearing a small gland, the pinnae 6-8 pairs; leaflets 12-35 pairs, oblong or linear-oblong, asymmetric, 10-12 mm. long, obtuse, green above, puberulent or glabrate, paler beneath, puberulent or glabrate, the costa close to the margin; flowers white, fragrant, in small dense globose heads, these arranged in large panicles; calyx strigillose, the corolla densely sericeous; ovary villous; legume narrowly oblong, 10-17 cm. long, 3 cm. wide, glabrous, rounded to subtruncate at the apex, the valves thin.

Known in British Honduras by the names "white tamarind," "bastard prickly yellow," "prickly yellow," "Jim Crow," and "wild tamarind"; "espino blanco" (Honduras); "cagalero," "zarzo," "palhuishte," "malacaro," "lora-sangre" (Salvador); "teposonte blanco" (Veracruz). The inner bark yields a small amount of sweet, yellowish resin. The sapwood is light brown, the heartwood dark pinkish or dark brown.

Acacia Hindsii Benth. Lond. Journ. Bot. 1: 504. 1842. *A. bursaria* Schenck, Repert. Sp. Nov. 12: 363. 1913 (type from San Felipe, Retalhuleu, Bernoulli & Cario 1129). *Myrmecodendron*

Hindsii Britt. & Rose, N. Amer. Fl. 23: 91. 1928. *Ixcanal*; *Iscanal*; *Subin* (Alta Verapaz, Quecchí).

Dry to wet thickets, abundant on gravel bars along and near streams, sometimes in thin lowland forest, 1,800 meters or less, mostly at 1,000 meters or lower; Alta Verapaz; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos. Western Mexico; British Honduras to Salvador and Panama.

A shrub or small tree, usually 6 meters high or less, the branches stout and stiff or sometimes slender, elongate, and drooping, glabrous or nearly so; spines usually very large, 3–5 cm. long, the free portions terete or somewhat compressed, spreading or ascending, the spines united below usually for half their length or more, the united portion usually broadened and somewhat compressed, commonly blackish and lustrous, sometimes pale; petiole with a row of elevated cupular glands, the pinnae 6–15 pairs; leaflets 12–20 pairs, linear-oblong, 3–8 mm. long, obtuse, glabrous or nearly so; flowers bright yellow, spicate, the spikes axillary, slender-pedunculate, often very numerous, slender and rather laxly flowered, 3–5 cm. long, the bractlets peltate; flowers glabrous; legume 4–6 cm. long, 12 mm. wide, blackish, usually rostrate, sessile, glabrous, dehiscent along the lower suture, the valves thick and coriaceous; seeds imbedded in fleshy pulp.

Sometimes known in Salvador by the names "cutupito," "iscanal negro," "cachito," and "guascanal." This plant belongs to the peculiar American group called "bullhorn" or "ant acacias," confined to Mexico, Central America, and Colombia, and referred by Britton and Rose to two separate genera, *Tauroceras* and *Myrmecodendron*. They are distinguished from other species primarily by their large, hollow spines that have more or less the appearance of the horns of a bull or ox, being united in pairs and either straight or variously curved. For an account of the group see W. E. Safford, *Acacia cornigera and its allies*, Journ. Wash. Acad. Sci. 4: 356–368. 1914. The classic account of these plants is that of Thomas Belt in *A Naturalist in Nicaragua*. In Guatemala there are no less than 9 species of this alliance, as many as are known from all of Mexico. The shrubs are abundant in most of the lowland areas and often form dense thickets, especially along rocky stream banks. The enlarged spines usually are inhabited by rather large and bellicose ants that bite fiercely and move with great rapidity. A complete colony of ants inhabits each spine, access to the interior of which is obtained by a small round hole punctured at some part of the spine's surface. The moment a bush is molested, numbers of the ants sally forth to attack the disturber, and they are very persistent in hunting him out. Birds often make their nests in the bushes, and evidently the ants do not molest them. Strangely enough, collecting speci-

mens of the bullhorn acacias is not a very painful task, for if the branches and spines can be got into the collecting press and it is closed, the ants seem never to leave the spines but may be found dead in the dried herbarium specimens. The ants subsist in part on conspicuous yellow nectar bodies borne on the tips of the small leaflets. Where these plants occur one will search in vain for a spine that has not been punctured by ants, but isolated bushes not infested sometimes are found. Near Retalhuleu the senior author was interested in finding extensive colonies of the bushes on which it was impossible to find any punctured spines at all, but this is most unusual. The usual name for all the species in most parts of Guatemala is "ixcanal" or "iscanal"; the name used in Quiché for one of the species is said to be "chocol." A *caserio* of El Progreso has been named Ixcanal.

Acacia hirtipes Safford, Journ. Wash. Acad. Sci. 4: 367. 1914.
Myrmecodendron hirtipes Britt. & Rose, N. Amer. Fl. 23: 92. 1928.

In thickets or pastures, 900–1,500 meters; so far as known, endemic; Santa Rosa (type from Río de las Cañas, *Heyde & Lux* 3299, in part); Escuintla; Guatemala.

A tree of 9 meters or less with spreading crown, the branches dark brown or fuscous; spines 3–4 cm. long, terete or slightly compressed, spreading or ascending, united only at the base, puberulent; pinnae 5–12 pairs; leaflets 9–18 pairs, 2.5–3.5 mm. long, obtuse, ciliate, 1-nerved; peduncles 1–2 cm. long, puberulent, stout, bearing a small involucre above the middle; flowers spicate, the spikes oblong, very dense, 11–15 mm. long; bractlets peltate, at first concealing the flower buds; immature legume sessile, compressed, acute at each end, puberulent.

Acacia mayana Lundell, Carnegie Inst. Wash. Publ. 478: 210. 1937. *Crucetillo*.

Petén, the type from San Diego, Río Pasión, *Mercedes Aguilar* 495; Alta Verapaz (Río Ixvolay). Tabasco.

A shrub or small tree, the branchlets glabrous; spines large, blackish, 4–7 cm. long, 1–2 cm. wide, shortly united below, strongly compressed, almost triangular in cross section, convex on the lower surface, concave on the upper, long-attenuate, the margins thin and acute; pinnae about 8 pairs; leaflets 10–35 pairs, linear-oblong, about 12 mm. long, 3-nerved at the base, rounded at the apex, glabrous; flowers spicate, the spikes racemose, the stout peduncles 1 cm. long or less, bearing an involucre at the base; spikes very thick and dense, 3–5.5 cm. long, the axis much thickened; legume dark ferruginous, terete, indehiscent, 8–12 cm. long, 2 cm. thick, the pericarp thin and fragile, narrowed into a long terminal spine.

The species is remarkable for its large, compressed spines, very unlike those of other bullhorn acacias.

Acacia neriifolia A. Cunn. ex Benth. Lond. Journ. Bot. 1: 357. 1842. *A. retinoides* Schlecht. Linnaea 20: 664. 1847.

Native of Australia, frequently planted for ornament, especially in Quezaltenango, and doubtless in other departments.

An unarmed shrub or small tree, glabrous throughout or nearly so, the branchlets angulate; leaves represented by leaf-like phyllodes, i.e. petioles, these resembling a simple leaf, linear-lanceolate or linear, 6–15 cm. long, attenuate to each end, sessile, bearing a gland above the base, many-nerved; flowers yellow, in small dense heads, these in axillary racemes; legume flat, 7–10 cm. long, 6–7 mm. wide; seeds oval, subtended by a fleshy aril.

Branches of this are sold in quantity in the Quezaltenango market, to be used as decorations. They retain their form when dry, and are much used for adorning altars.

Acacia pennatula (Schlecht. & Cham.) Benth. Lond. Journ. Bot. 1: 390. 1842. *Inga pennatula* Schlecht. & Cham. Linnaea 5: 593. 1830. *Poponax pennatula* Britt. & Rose, N. Amer. Fl. 23: 88. 1928. *Espino negro*; *Mesquite*; *Espino blanco*; *Espino jiote*; *Saespino*.

Brushy plains and hillsides, often on open rocky slopes, frequent in pine-oak forest, 250–2,300 meters; Alta Verapaz; Baja Verapaz; Zacapa; El Progreso; Jalapa; Jutiapa; Santa Rosa; Guatemala; Chimaltenango; Huehuetenango. Mexico; Salvador; Nicaragua; Colombia.

A shrub or small tree, 2–6 meters high, rarely as much as 12 meters high, usually with a short trunk and broad spreading flat-topped crown, the young branchlets densely tomentose or pilose; spines short, stout, 1.5 cm. long or shorter; petiole bearing a large cupular gland, the pinnae very numerous pairs; leaflets many pairs, oblong, 2–3 mm. long, pubescent, obtuse, crowded in the pinnae; flowers yellow, fragrant, in dense globose heads; peduncles axillary, usually fasciculate, 1–2.5 cm. long; legume oblong, pubescent when young, glabrate in age, 6–12 cm. long, 1.5–3 cm. wide, tardily dehiscent, the valves ligneous, thick, dark ferruginous or blackish; seeds globose or nearly so, 7 mm. long, surrounded by pulp.

Sometimes called “espino jiote” in Salvador. This is a characteristic shrub of the plains and hillsides of the lower Motagua Valley and of many places in the Oriente, also over much of Baja Verapaz, often forming stands of great extent. It is easily recognized from a distance because of the peculiar, spreading, flat-topped form of the bushes. It sometimes grows abundantly in open stands of pine and oak.

Acacia polypodioides Standl. Contr. U. S. Nat. Herb. 20: 184. 1919. *A. Calderoni* Standl. Journ. Wash. Acad. Sci. 13: 439. 1923

(type collected on Cerro de la Olla, near Chalchuapa, Salvador).
Acaciella polypodioides Britt. & Rose, N. Amer. Fl. 23: 98. 1928.

Brushy, often rocky slopes, 250–900 meters; Zacapa; Chiquimula. Southern Mexico; Salvador.

An unarmed shrub, the branchlets densely pilose and glandular; leaves small, the pinnae 2–8 pairs, the petiole eglandular; leaflets 12–25 pairs, oblong, 2.5–6 mm. long, obtuse, lustrous above and puberulent, pale beneath and glabrous, rather thick, the margins conspicuously revolute, the lateral nerves conspicuous, almost perpendicular to the costa; flowers white, in dense, globose, head-like umbels, these axillary or often in terminal racemes; calyx and corolla puberulent; legume linear-oblong, 3–5 cm. long, 8–10 mm. wide, long-acuminate, acute at the base, stipitate, pubescent, flat, the valves thin.

Called “guajillo” in Salvador. Britton and Rose recognized *A. polypodioides* and *A. Calderoni* as distinct species, one having “capitate,” the other short-racemose flowers, but this character is a variable one and not reliable.

Acacia riparioides (Britt. & Rose) Standl. Field Mus. Bot. 3: 277. 1930. *Senegalia riparioides* Britt. & Rose, N. Amer. Fl. 23: 117. 1928. *Sare*.

Moist or dry thickets on plains or hillsides, 150–900 meters; Jutiapa; Santa Rosa. Yucatan Peninsula of Mexico; Salvador (type from Ahuachapán).

A large shrub or a tree sometimes 6 meters high, the branches sometimes recurved, usually abundantly armed with small broad-based recurved prickles, puberulent or glabrous; petiole bearing a small orbicular gland, the pinnae 7–10 pairs; leaflets 15–30 pairs, oblong-linear, subacute, 4–7 mm. long, puberulent or glabrous, often ciliate, the lateral nerves often conspicuous beneath and divergent at almost a right angle from the costa; flowers white, fragrant, in globose heads, glabrous or puberulent, the heads fasciculate in the leaf axils or forming large terminal panicles; legume flat, 6–11 cm. long, about 2 cm. wide, obtuse and apiculate, short-stipitate, puberulent, the valves thin.

Called “yaxcatzim” in Yucatan; “zarza” in Salvador. The bark is reported to be very rich in tannin and to be used in Yucatan for tanning skins.

Acacia spadicigera Schlecht. & Cham. Linnaea 5: 594. 1830. *Tauroceras spadicigerum* Britt. & Rose, N. Amer. Fl. 23: 85. 1928. *Pico de gurrión*; *Pico de gorrión*; *Subtn* (Quechí and Maya); *Subtn blanco* (Petén).

Moist or dry thickets or thin forest of the lowlands, chiefly on the plains, 900 meters or less; Petén; Alta Verapaz; Baja Verapaz;

Escuintla; Suchitepéquez; Retalhuleu; doubtless in all the Pacific coast departments. Mexico; Honduras; Costa Rica.

A shrub or small tree, 6 meters tall or less, the branches glabrous; spines large, hollow, terete, 8 cm. long or less, usually pale and divergent, shortly united at the base; pinnae 1-12 pairs; leaflets numerous, oblong-linear, 5-7 mm. long, glabrous, rounded at the apex; peduncles axillary, solitary or clustered, usually very short and thick, bearing a cupular involucre at the base; flowers yellow, the spikes very dense, oblong, 1-2.5 cm. long, with a thick rachis; bractlets peltate, pointed at the upper end; legume oblong, broadest near the apex, terete, indehiscent, dark red at maturity, the body usually 4-5 cm. long and 1.5 cm. thick, contracted into a thick stipe, abruptly contracted at the apex into a long, slender, needle-like beak; seeds surrounded by abundant pulp.

This species is well known in Guatemala under the name "pico de gorrión" (hummingbird beak, in allusion to the slender beak of the fruit) and is abundant along the plains of the Pacific coast, often forming dense thickets. The pulp of the mature fruit is eaten commonly, and quantities of the pods often are displayed in the markets, being carried from the plains even up to Quezaltenango for sale.

Acacia tortuosa (L.) Willd. Sp. Pl. 4: 1083. 1806. *Mimosa tortuosa* L. Syst. Nat. ed. 10. 1312. 1759. *Poponax tortuosa* Raf. Fl. Tell. 118. 1838.

Dry brushy plains, 200 meters; Zacapa (near Estanzuela, Steyermark 29088). Mexico; West Indies.

Usually a shrub of 1.5-5 meters, much branched, the branches dark ferruginous or blackish, densely pubescent at first, armed with stout grayish spines 1-3 cm. long; pinnae 2-8 pairs; leaflets 10-20 pairs, oblong-linear, 4-7 mm. long, obtuse, pubescent; flowers yellow, in dense globose heads, the slender peduncles 1.5-3 cm. long, pilose, solitary or fasciculate; legume linear, 8-14 cm. long, turgid, about 6-8 mm. in diameter, dark ferruginous, densely pubescent, sessile, often somewhat constricted between the seeds.

ALBIZZIA Durazzini

Unarmed shrubs or trees; leaves bipinnate, the leaflets very numerous and small, or large and rather few, with glands on the rachis and between the pinnae; stipules setaceous or obsolete, rarely large and membranaceous; peduncles axillary or in terminal panicles, the flowers spicate or in globose heads, mostly 5-parted, perfect or rarely polygamous; calyx campanulate or tubular, dentate or shallowly lobate; corolla funnelform, lobate to the middle or less deeply, the lobes valvate; stamens numerous, united at the base or sometimes higher to form an elongate tube, often greatly elongate, the anthers small; fruit broadly linear, straight, compressed, flat, indehiscent or 2-valvate, the valves thin, neither elastic nor contorted; seeds ovate or orbicular, compressed, the funicles filiform.

Probably 75 species, most numerous in the Old World tropics. About 3 additional species have been recorded from other parts of Central America.

Leaflets small, 6 mm. wide or less, or rarely slightly larger.

Branches, peduncles, leaflets, and fruit glabrous or with sparse pubescence of short appressed hairs.....*A. idiopoda*.

Branches, peduncles, lower leaf surface, and fruit tomentulose or densely short-pilose with spreading hairs.....*A. tomentosa*.

Leaflets large, more than 1 cm. wide and often 2 cm. or more.

Flowers capitate, sessile; leaflets mostly acute or acuminate, pale beneath.

A. adinocephala.

Flowers umbellate, pedicellate; leaflets rounded at the apex, not pale beneath.

Leaflets glabrous or nearly so; calyx 4 mm. long; fruit glabrous...*A. Lebbeck*.

Leaflets densely short-pilose beneath; calyx 6-7 mm. long; fruit pubescent.
A. longepedata.

Albizzia adinocephala (Donn. Smith) Britt. & Rose, N. Amer. Fl. 23: 47. 1928. *Pithecolobium adinocephalum* Donn. Smith, Bot. Gaz. 57: 419. 1914 (type from Costa Rica). *P. discolor* Pittier, Contr. U. S. Nat. Herb. 20: 464. 1922. *Gavilancillo*, *Palometa* (fide Aguilar).

Moist or wet forest, mostly on hillsides, sometimes along borders of streams or in other low ground, 1,400 meters or less, chiefly below 800 meters; Alta Verapaz; Izabal; Santa Rosa; Guatemala; Escuintla; Suchitepéquez; Retalhuleu. British Honduras; Honduras; Salvador; Costa Rica; Panama.

A large tree, sometimes 30 meters high with a trunk 50 cm. or more in diameter, the branchlets glabrous or nearly so; petioles 2-7 cm. long, bearing an oblong or ovate gland near the base; pinnae 1-3 pairs, the leaflets 2-5 pairs, lance-oblong to ovate, 2-6 cm. long, usually acute or acuminate, obtuse or subacute at the base, rather thick and firm, often lustrous above, glabrous or nearly so, with prominent reticulate venation, pale beneath and glabrous or nearly so, usually bright green when dried; inflorescence of small racemiform panicles, the peduncles slender, puberulent, 1-2 cm. long, the flowers in dense globose heads; calyx puberulent, 1.5-2 mm. long, with subacute teeth; corolla 3 mm. long, almost glabrous; stamen tube included, the filaments creamy white; legume broadly linear, 10-17 cm. long, 1.5-2 cm. wide, short-stipitate, glabrous, 10-18-seeded.

Known in Salvador by the names "chipilse," "chipilse," "chalultapa," and "conacaste blanco." The wood is brownish, moderately hard, strong, and coarse-textured. So far as known, no use is made of it.

Albizzia idiopoda (Blake) Britt. & Rose, N. Amer. Fl. 23: 44. 1928. *Pithecolobium idiopodum* Blake, Contr. Gray Herb. 52: 70.

1917 (type collected on pine ridge, Manatee Lagoon, British Honduras, *M. E. Peck* 437).

Hilly pine forest or on forested plains, 300 meters or less; Petén. Campeche; Yucatan; British Honduras.

A tree, sometimes 20 meters high with a trunk 45 cm. in diameter, the branchlets sometimes reddish-puberulent but usually glabrous or nearly so; leaf rachis bearing a large gland between each pair of pinnae; pinnae usually 3-4 pairs, the leaflets generally 12-20 pairs, narrowly oblong, 9-18 mm. long, obtuse, subtruncate at the base, sparsely appressed-pilous or almost glabrous, paler beneath, indistinctly veined; peduncles axillary and geminate, short or elongate, the flowers sessile in small globose heads; calyx puberulent, 2.5 mm. long, with acute teeth; flowers white, fragrant, the corolla 6.5 mm. long, pubescent; stamen tube about equaling the corolla tube; legume 10-18 cm. long, 2-2.5 cm. wide, glabrous or nearly so, long-attenuate at the apex, acute or attenuate at the base and long-stipitate.

Called "salem" in British Honduras, probably a Maya name or a modification of one. The bark is employed there for tanning.

Albizzia Lebbeck (L.) Benth. Lond. Journ. Bot. 3: 87. 1844.
Mimosa Lebbeck L. Sp. Pl. 516. 1753.

Native of the Old World tropics, probably of Africa, and sometimes planted as a shade tree in tropical America; planted in British Honduras and perhaps also in Guatemala.

A tree, sometimes 15 meters high but usually lower, the branchlets puberulent or glabrous; leaves large, the petiole bearing a large oblong gland; pinnae 2-4 pairs, the leaflets 4-9 pairs, sessile, oblong or obovate, 2-4 cm. long, obtuse or rounded at the apex, obtuse at the base, glabrous or nearly so, reticulate-veined, thin; peduncles 3-10 cm. long, the flowers fragrant, cream-colored or yellowish, in large head-like umbels, the pedicels pubescent, 2-5 mm. long; calyx narrowly campanulate, pubescent, 4 mm. long; corolla 6 mm. long; stamens as much as 3 cm. long; legume oblong or broadly linear, 15-30 cm. long, 2-5 cm. wide, glabrous, lustrous, pale; seeds 1.5 cm. long.

Called "canjuro" and "acacia" in Salvador. The tree is infrequent in Central America but very common in Cuba, as about Havana. The large pods hang upon the tree long after the leaves have fallen during the dry season and make a great clatter in the wind. Because of this clatter, and perhaps also because of the shape of the pods, the tree is often called "woman's tongue tree." The wood is used in India for furniture and general construction, and also for fuel.

Albizzia longepedata (Pittier) Britt. & Rose, N. Amer. Fl. 23: 46. 1928. *Pithecolobium longepedatum* Pittier, Contr. U. S. Nat. Herb. 20: 464. 1922 (type from Costa Rica). *Cadeno*.

Moist or dry forest, 300 meters or less; Izabal; Zacapa; El Progreso. Salvador; Costa Rica; Panama; Colombia and Venezuela.

A large tree, the branchlets short-pilose; leaves large, the pinnae 2-6 pairs; leaflets 3-7 pairs, mostly obovate or oval-ovate, often rhombic, 1.5-4 cm. long, rounded or emarginate at the apex, obtuse or rounded and often somewhat oblique at the base, softly pubescent on both surfaces, more densely so beneath; peduncles axillary, 3-7 cm. long, the flowers umbellate, the tomentose pedicels 8-15 mm. long; calyx tubular-campanulate, 6-7 mm. long; corolla green, tomentose, 9-10 mm. long; stamens pink or white, the tube shorter than the corolla; legume almost sessile, linear, 15-20 cm. long, 2.5-3.5 cm. wide, densely pubescent, often long-rostrate.

Albizzia tomentosa (Micheli) Standl. Journ. Wash. Acad. Sci. 13: 6. 1923. *Pithecolobium tomentosum* Micheli, Mém. Soc. Phys. Hist. Nat. Genève 34: 285. 1903. *A. Hummeliana* Britt. & Rose, N. Amer. Fl. 23: 46. 1928 (type from Hillbank, British Honduras, *S. J. Record* 27).

In forest, at or little above sea level; British Honduras; western Mexico southward to Yucatan.

A tree, sometimes 15 meters high with a trunk 50 cm. in diameter, the crown widely spreading, open, the bark pale brown or gray-brown, slightly scaly or fairly smooth, the inner bark whitish to pinkish red, the young branches densely tomentulose; petioles bearing a large oblong depressed gland near the base; pinnae 3-4 pairs, the leaflets 6-11 pairs, oblong or oblong-obovate, 1-2 cm. long, obtuse or rounded at the apex, tomentulose or velutinous-pilosulous on both surfaces, paler beneath; flowers whitish, capitate, the heads small, globose, dense, paniculate, the peduncles 5-20 mm. long, tomentulose; calyx 1.5 mm. long; corolla 5 mm. long, tomentulose, the small lobes ovate; stamen tube slightly shorter than the corolla; legume linear-oblong, 8-15 cm. long, 2-2.5 cm. wide, softly puberulent or glabrate; seeds oval, 8 mm. long.

Called "wild tamarind" and "prickly yellow" in British Honduras; "tepesontle" (Oaxaca); "guanacastillo," "nacastillo" (Veracruz); called "parotilla" in central Mexico; "xiahtsimin" (Yucatan, Maya). The heartwood is brownish, the sapwood thick, yellowish, tough, and strong, of about the consistency of hickory (*Carya*); not resistant to decay or insects.

CALLIANDRA Bentham

Shrubs or small trees, sometimes herbs, unarmed; leaves bipinnate, the leaflets membranaceous or coriaceous, small and many-jugate or large and 1-few-jugate; stipules usually persistent, often crowded at the base of young shoots, membranaceous to indurate, sometimes spinose; peduncles axillary or in terminal racemes, solitary or fasciculate, the flowers in globose heads, 5-parted or rarely 6-parted, polygamous; calyx campanulate, dentate or lobate; corolla funnelform

or campanulate, lobate to about the middle, the segments valvate; stamens numerous (10-100), connate at the base or higher, long-exserted, often greatly elongate and showy, the anthers minute, usually glandular-pubescent, sometimes glabrous; ovary sessile, many-ovulate, the style filiform, the stigma terminal, obtuse or capitate; legume linear, straight or nearly so, narrowed at the base, flat-compressed, with thickened margins, 2-valvate, the valves elastically dehiscent from the apex to the base, continuous within; seeds obovate or orbicular, compressed, the funicle short.

Species 150 or more, one in India, the others in tropical America, a few extending to southwestern United States. A few additional ones occur in southern Central America.

Leaflets 7 or fewer, mostly 2-10 cm. long, coriaceous; plants woody throughout; stamens usually purple-red.

Leaflets 6-7, acute or acuminate, the larger ones 10-17 cm. long.

C. rhodocephala.

Leaflets 3-4, mostly obtuse, smaller.

Leaflets abundantly pilose beneath with spreading hairs *C. mexicana*.

Leaflets glabrous or nearly so, sometimes puberulent on the nerves or with a few short scattered hairs on either surface *C. emarginata*.

Leaflets generally more than 7, often very numerous, usually small.

Flower heads in terminal racemes or panicles.

Stipules large, rounded; leaflets mostly oval and 15 mm. wide . . . *C. Quetzal*.

Stipules small and narrow.

Pinnae only 1 pair *C. Wendlandii*.

Pinnae 5-25 pairs.

Leaflets somewhat cultriform, acute, the costa conspicuously excentric; corolla brown-strigose *C. Houstoniana*.

Leaflets straight or nearly so, mostly obtuse, the costa central or nearly so.

Flowers glabrous; legume glabrous or nearly so *C. confusa*.

Flowers densely strigose or pilose; legume densely pilose or strigose.

C. grandiflora.

Flower heads all or mostly axillary, solitary or few-fasciculate.

Leaflets chiefly obovate to oval, mostly 7-15 mm. wide or even wider.

Leaflets abundantly pilose beneath *C. penduliflora*.

Leaflets glabrous or nearly so.

Leaflets 3-7 pairs, membranaceous, not lustrous *C. capillata*.

Leaflets 7-11 pairs, subcoriaceous, very lustrous *C. carcerea*.

Leaflets linear-oblong or narrowly oblong, 5 mm. wide or narrower.

Leaves with 2-7 pairs of pinnae.

Branches 4-angulate *C. tetragona*.

Branches terete.

Flower heads long-pedunculate, the bracts minute . . . *C. portoricensis*.

Flower heads sessile or nearly so, the bracts large, ovate-lanceolate, indurate, persistent *C. belizensis*.

Leaves with only 1 pair of pinnae.

Legume glabrous; leaflets 5-6 mm. long, rounded at the base.

C. Caeciliae.

Legume strigose; leaflets 8-18 mm. long, obliquely truncate at the base.

C. Tonduzii.

Calliandra belizensis (Britt. & Rose) Standl. Field Mus. Bot. 4: 309. 1929. *Anneslia belizensis* Britt. & Rose in Standl. Trop. Woods 11: 19. 1927.

Upland *Achras* forest, 200 meters or less; Petén (Carmelita, *F. E. Egler* 42-245). British Honduras, at low elevations, the type from Hillbank, Orange Walk District, *H. W. Winzerling* VII.4.

A shrub or small tree with very hard wood, the branchlets appressed-hispid; leaves short-petiolate, the pinnae usually 2 pairs, the rachis hispidulous; leaflets about 20 pairs, coriaceous, linear-oblong, 8-12 mm. long, acute, glabrous, sparsely appressed-ciliate, lustrous above, pale beneath; heads 1 or more at the ends of the branches, sessile or nearly so, large, excluding the stamens almost 2 cm. in diameter, the bracts very conspicuous, large, striate, persistent, ciliate with long white hairs, the outer ones somewhat pilose dorsally; calyx 5-6 mm. long, the tube glabrous, striate, the teeth pubescent; corolla 1 cm. long, glabrous except on the puberulent lobes; stamens very numerous, 3-6 cm. long; legume 9-10 cm. long, 9 mm. wide near the apex, attenuate to the base, subacute, densely white-lanate.

Local names are "capulín de corona" and "barba de viejo." The inflorescences, with their numerous, hard, persistent bracts, are very unlike those of any other Central American species.

Calliandra Caeciliae Harms, Repert. Sp. Nov. 17: 89. 1921. *C. densifolia* Harms, loc. cit., nomen nudum. *Anneslia Caeciliae* Britt. & Rose, N. Amer. Fl. 23: 61. 1928. *Suc. Tepehuac* (Huehuetenango).

Dry, rocky, brushy or forested mountain slopes, 800-1,400 meters; Jutiapa; Huehuetenango (type from Guaxacaná, *C. & E. Seler* 3006). Southern Mexico.

A stiff shrub 2-4 meters high, sometimes a small tree, the young branchlets appressed-pilose; leaves often densely clustered on short lateral branches, short-petiolate or almost sessile; stipules ovate, acute, striate, persistent; pinnae 1 pair, the leaflets 20-40 pairs, linear-oblong, 5-6 mm. long, acute or obtuse, subcoriaceous, ciliate, appressed-pilose beneath or glabrous, conspicuously reticulate-veined; heads small and few-flowered, on very short peduncles; calyx 2 mm. long, glabrous, or puberulent on the short teeth; corolla glabrous, purplish, twice as long as the calyx; stamens purple and white or pink, elongate, the tube often long-exserted; legume 6-8 cm. long, 7-8 mm. wide, rounded and apiculate at the apex, glabrous.

Calliandra capillata Benth. Lond. Journ. Bot. 3: 98. 1844. *Acacia gracilis* Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 311. 1843.

Anneslia Cookii Britt. & Rose, N. Amer. Fl. 23: 68. 1928 (type collected between Yaxmuján and Yaxjá, Petén, O. F. Cook & R. D. Martin 209). *A. salvadorensis* Britt. & Rose, loc. cit. (type from San Salvador, Salvador). *A. izalcoensis* Britt. & Rose, op. cit. 69. 1928 (type from Izalco, Salvador). *C. gracilis* Standl. Field Mus. Bot. 4: 309. 1929, not Griseb. 1861. *C. Cookii* Standl. op. cit. 3: 277. 1930.

Chiefly in wet thickets, 1,800 meters or less; Petén; Alta Verapaz; Santa Rosa; Sacatepéquez; Chimaltenango. Western and southern Mexico; British Honduras; Salvador; probably extending to Costa Rica.

A slender shrub or a small tree, sometimes 6 meters high, glabrous throughout or with sparse hairs on the branches and leaves; stipules oblong-lanceolate, persistent, 3–5 mm. long, obtuse or acute; leaves long-petiolate, the pinnae 1–3 pairs; leaflets 3–7 pairs, membranaceous, mostly 1–2 cm. long, broadly oblong to broadly obovate, rounded to subacute at the apex, obtuse and oblique at the base, glabrous or practically so, green above, paler beneath; peduncles axillary, solitary or fasciculate, very slender, 2–5 cm. long or longer; heads rather few-flowered; calyx 1–2 mm. long, glabrous; corolla pale green, twice as long as the calyx, glabrous; stamens numerous, white, 1.5–2 cm. long; legume 5–10 cm. long, 6–10 mm. wide, glabrous, obtuse or rounded at the apex, attenuate to the base, containing numerous seeds, straight or slightly falcate.

As here treated, the species includes several of those recognized by Britton and Rose, all based upon variable and inconsequential characters. Several additional species that they recognized are reducible to its synonymy.

Calliandra carcerea Standl. & Steyermark. Field Mus. Bot. 23: 161. 1944. *Tamarindo de montaña*.

Known only from the type, El Progreso, slopes of *quebradas*, between Calera and middle slopes of Volcán Siglo, 2,000–2,200 meters, *Steyermark* 42985.

A shrub or small tree, the branches slender, subterete, ochraceous, densely hirtellous when young; stipules small, lanceolate, rather rigid, persistent, attenuate-acuminate, brown-hirtellous; leaves on petioles 10–14 mm. long, the pinnae 1 pair, 4.5–7.5 cm. long; leaflets 7–11 pairs, unequal in size and often oblique, coriaceous, very lustrous, oblong-elliptic to ovate, 12–23 mm. long, mostly 4–8 mm. wide, obtuse or subacute, obtuse or rounded at the oblique base, glabrous, ciliate, penninerved, the nerves and veins prominulous on both surfaces and laxly reticulate; peduncles axillary, solitary, slender, about 2 cm. long, hirtellous, the heads rather few-flowered; bracts 2 mm. long, linear-lanceolate, puberulent; calyx glabrous, puberulent on the lobes, 3 mm. long, striate, the teeth very short; corolla 7–8 mm. long, glabrous, the limb pubescent on the teeth; stamens much elongate, dark bright red; legume borne on a stipe 2.5–3 cm. long, linear, straight,

7-7.5 cm. long, 7-8 mm. wide, obtuse and apiculate, attenuate at the base, glabrous.

Calliandra confusa Sprague & Riley, Kew Bull. 371. 1923 (type from Cobán, Alta Verapaz, *Tuerckheim* 690). *Anneslia confusa* Britt. & Rose, N. Amer. Fl. 23: 70. 1928. *Cabello de ángel*; *Canilla*.

Dry to wet thickets, often on steep open slopes, 300-1,800 meters; Alta Verapaz; Izabal; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Sololá; Retalhuleu; Quezaltenango. Chiapas; British Honduras; Costa Rica; Panama.

Usually a shrub of 2-3 meters but sometimes a small tree 6 meters high, sparsely branched or often simple, the young branches and leaves more or less appressed-setulose or strigose with ferruginous hairs, glabrate in age; leaves petiolate, the pinnae about 15 pairs; leaflets commonly 25-30 pairs, linear, acute or obtuse, sometimes appressed-ciliate, the costa almost central; inflorescence terminal, consisting of a short or elongate raceme of few or numerous heads; peduncles fasciculate, short; calyx 1.5-2 mm. long; corolla 5-6 mm. long, glabrous, green, the lobes subacute; stamens purple-red, 4 cm. long, very numerous; legume commonly 8-11 cm. long and 12 mm. wide, glabrous or nearly so, long-attenuate to the base, brownish, the margins strongly thickened.

The Maya name "ichumpich" is reported from British Honduras. When in bloom the shrub is a showy and rather handsome one, the large heads with their very numerous, hair-like stamens being highly colored in purple-red.

Calliandra emarginata (Humb. & Bonpl.) Benth. Lond. Journ. Bot. 3: 95. 1844. *Inga emarginata* Humb. & Bonpl. ex Willd. Sp. Pl. 4: 1009. 1806. (?) *Inga semicordata* Bertol. Fl. Guat. 441. 1840 (type from Guatemala, *Velásquez*). *Anneslia centralis* Britt. & Rose, N. Amer. Fl. 23: 52. 1928. *A. yucatanensis* Britt. & Rose, op. cit. 53. 1928. *A. cruziana* Britt. & Rose, op. cit. 54. 1928. *A. juchitana* Britt. & Rose, op. cit. 55. 1928. *C. rivalis* Lundell, Bull. Torrey Club 64: 549. 1937 (type from Río Frío, San Agustín, El Cayo District, British Honduras, *C. L. Lundell* 6610).

Dry, open, often rocky slopes or plains, often in pine forest, 1,600 meters or less; Petén; Alta Verapaz; El Progreso; Izabal; Jutiapa; Santa Rosa; Huehuetenango. Southern Mexico; British Honduras; Honduras.

Usually a dense gnarled shrub a meter high or less, or in wet regions sometimes becoming a small tree of 6 meters or less, the branches short-pilose or glabrate; stipules small and inconspicuous, subulate; leaves petiolate, the pinnae 1 pair, the leaflets $1\frac{1}{2}$ pairs (that is, each pinna with 3 leaflets), oblong to broadly

obovate, rounded to subacute, sometimes subemarginate, 1-5 cm. long or somewhat larger, reticulate-veined, glabrous or nearly so, at least in age; peduncles axillary or subpaniculate at the ends of the branches, 1-3 cm. long; heads mostly rather few-flowered; calyx 1.5-2 mm. long, glabrous or almost so; corolla 5-7 mm. long, glabrous or nearly so; stamens bright red, 2.5 cm. long; legume 8-10 cm. long, 8-12 mm. wide, attenuate to the base, glabrous.

This has been reported from Guatemala as *C. tergemina* Benth. It is probably the plant reported from Guatemala by Hemsley as *C. Seemannii* Benth., which is a Panama species, perhaps not distinct from *C. emarginata*. Britton and Rose multiplied inordinately the species of this group, as is obvious upon mere examination of their key to species and much more evident when a large series of specimens is examined. Several additional Mexican synonyms of the species could be cited. The leaflets, even on specimens from the same locality, vary so much in texture, shape, and size that it is evident these characters do not afford a basis for separating closely related species, and no better means of segregating them are apparent. Dwarf plants of this species with numerous heads of bright red flowers are very pretty and can be recognized from a long distance in the often sparse vegetation where they occur. Where more abundantly supplied with moisture, the plants sometimes produce paler flowers, and those of some collections are described as having even white stamens.

Calliandra grandiflora (L'Hér.) Benth. in Hook. Journ. Bot. 2: 139. 1840. *Mimosa grandiflora* L'Hér. Sert. Angl. 30. 1788. *Anneslia Conzattiana*, Britt. & Rose, N. Amer. Fl. 23: 72. 1928. *C. grandiflora* f. *pubescens* Micheli ex Donn. Smith, Enum. Pl. Guat. 4: 51. 1895, nomen. *Cabellos de ángel*; *Barbasol*; *Barba de león*; *Señorita de monte*; *Guajito real* (fide Aguilar); *Cola de tijereta*.

Dry or moist, brushy or open hillsides, often in pine or oak forest, frequently in rocky places, 1,000-2,700 meters; Alta Verapaz; Zacapa; Chiquimula; Jalapa; Guatemala; Sacatepéquez; Chimaltenango; Sololá; Quiché; Huehuetenango; Quezaltenango. Southern Mexico.

Commonly a shrub of 1-2 meters, simple or with few branches, sometimes a small tree of 5-6 meters, the branchlets and leaf rachises more or less short-pilose with brownish or whitish hairs; leaves petiolate, the pinnae 8-20 pairs; leaflets 20-40 pairs, linear-oblong, straight, 4-7 mm. long, acute or obtuse, ciliate, glabrous or sparsely appressed-pilosulous beneath; racemes short and dense or often elongate, with a thick rachis, the peduncles of the heads short, the flowers short-pedicellate; calyx 2-4 mm. long, strigose; corolla strigose, 10-12 mm. long; stamens purple-red or bright red, 5 cm. long, numerous; legume 6-9 cm. long, 12-15 mm.

wide, densely hispid, obtuse or rounded and rostrate at the apex, containing usually 3-5 seeds.

This is a handsome plant, in general appearance much like the more common *C. confusa*.

Calliandra Houstoniana (Mill.) Standl. Contr. U. S. Nat. Herb. 23: 386. 1922. *Mimosa Houstoniana* Mill. Gard. Dict. ed. 8. No. 16. 1768. *C. Houstoni* Benth. in Hook. Journ. Bot. 2: 139. 1840. *Vainillo*.

Brushy or open, moist or dry slopes, often on faces of cliffs, sometimes in pine-oak forest, 2,200 meters or less; Petén; Alta Verapaz; Izabal; Zacapa; Chiquimula; Jalapa; Jutiapa; Guatemala; Chimaltenango; Huehuetenango. Southern Mexico; British Honduras; Honduras; Salvador.

A shrub 1-3 meters high, simple or with few branches, the stems densely pilose or hirsute; pinnae 7-12 pairs, the leaflets 30-40 pairs, oblong-linear, somewhat cultriform, 4-7 mm. long, acute, coriaceous, glabrous and lustrous above, paler beneath and strigose; racemes short or elongate, the heads few or numerous, short-pedunculate, the flowers short-pedicellate; calyx 2 mm. long, ferruginous-strigose; corolla 8-10 mm. long, densely strigose; stamens purple-red, 4-5 cm. long, very numerous; legume 8-12 cm. long, 1.5-2 cm. wide near the apex, densely brown-hispid, obtuse and apiculate, attenuate to the base, the valves very thick.

Called "charamusco" in Tabasco and "hierba de burro" in Chiapas. According to the *U. S. Dispensatory*, the root bark (probably also of other related species), under the name "pambotano bark," has been highly recommended in Europe as an antiperiodic. It is said also to contain an alkaloid that produces death by systolic arrest of the heart.

Calliandra mexicana Brandeg. Univ. Calif. Publ. Bot. 10: 183. 1922. *Anneslia Deamii* Britt. & Rose, N. Amer. Fl. 23: 56. 1928 (type from Gualán, Zacapa, *C. C. Deam* 6258). *Calliandra Deamii* Standl. Field Mus. Bot. 4: 309. 1929. *Pata de venado*; *Barba de cabro* (fide Aguilar).

Generally on rather dry, rocky, brushy or open slopes, 200-1,500 meters; Petén; Baja Verapaz; El Progreso; Zacapa; Chiquimula; Jalapa; Jutiapa; Escuintla; Guatemala; Huehuetenango. Yucatan.

Usually a low, gnarled, often depressed shrub a meter high or less, but sometimes taller and as much as 4.5-9 meters high, the branches short-pilose; stipules minute, lanceolate; leaves petiolate, the pinnae 1 pair, the leaflets 1½ or 2 pairs, oblong or broadly obovate, mostly 1-2.5 cm. long, sometimes larger, obtuse or rounded at the apex, obtuse at the base, rather densely pilose on both surfaces, more densely so beneath, reticulate-veined; peduncles mostly axillary, solitary or

fasciculate, about equaling the petioles, the heads few-flowered; calyx tubular-campanulate, 2–2.5 mm. long, short-pilose; corolla 6 mm. long, pubescent; stamens purple-red; legume 5–11 cm. long, 6–7 mm. wide; densely and finely pubescent, acute or obtuse, long-attenuate to the base.

This species exhibits about the same variation in shape and size of leaflets that is found in *C. emarginata*, and is probably no more than a pubescent variety of that. It is quite probable, also, that the proper and older name for the species is *C. tetraphylla* (Don) Benth.

Calliandra penduliflora Rose, Contr. U. S. Nat. Herb. 5: 193. 1899. *Anneslia penduliflora* Britt. & Rose, N. Amer. Fl. 23: 69. 1928. *A. chapaderoana* Britt. & Rose, loc. cit. (type from Chapadero, Santa Rosa, Heyde & Lux 3740). *C. chapaderoana* Standl. Field Mus. Bot. 4: 309. 1931. *Chichipil*; *Chipilín de monte*.

Moist or dry, brushy or open slopes, 250–1,800 meters; Baja Verapaz; Zacapa; Chiquimula; Guatemala; Chimaltenango; Sololá; Quiché; Huehuetenango. Southern Mexico.

A slender shrub 3–4.5 meters high with pale stems, the branchlets densely short-pilose, in age glabrate; stipules lance-oblong, 6–10 mm. long, striate; pinnae 1–3 pairs, the leaflets 4–6 pairs, broadly oblong to broadly obovate, mostly 2–3 cm. long, sometimes larger, rounded at the apex, obtuse and oblique at the base, appressed-pilose on both surfaces, sometimes glabrate above; peduncles mostly axillary and solitary, often greatly elongate, sometimes paniculate at the ends of the branches; flowers glabrous, the calyx short; corolla pale green, 4 mm. long; stamens white or pinkish, 2–4 cm. long; legume 5–8 cm. long, 6–10 mm. wide, glabrous, obtuse to broadly rounded at the apex, short-attenuate at the base.

Called “barbón montañés” in Salvador.

Calliandra portoricensis (Jacq.) Benth. Lond. Journ. Bot. 3: 99. 1844. *Mimosa portoricensis* Jacq. Coll. Bot. 4: 143. 1790. *Tamarindo de monte*.

Moist or wet thickets, rarely on dry hillsides, often in second growth, 1,500 meters or less; Alta Verapaz; Izabal; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Quiché; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos; Huehuetenango. Southern Mexico; British Honduras; Salvador to Costa Rica and Panama; West Indies.

A shrub of 2–4 meters, sometimes herbaceous almost throughout, occasionally weak and subscandent, the branchlets puberulent or glabrate, sometimes short-pilose; pinnae 2–6 pairs, the leaflets 10–30 pairs, oblong-linear, 8–16 mm. long, straight or nearly so, thin, ciliate, obtuse or rounded at the apex, glabrous or nearly so; peduncles axillary, 3–10 cm. long, solitary or fasciculate, the heads usually many-flowered; calyx 2 mm. long or shorter, glabrous; corolla pale green,

3-4 mm. long; stamens very numerous, white, 1.5-2 cm. long; legume 4-10 cm. long, 6-11 mm. wide, obtuse or rounded at the apex, attenuate to the base, glabrous or nearly so, usually with numerous seeds.

The name "riverain shrub" is reported from British Honduras; "guacamaya montés" (Salvador). The species has been reported from Guatemala as *C. caracasana* (Jacq.) Benth., a South American species doubtfully distinct from *C. portoricensis*. The flower heads with their crowded long white stamens are pretty and graceful when the flowers first open, reminding one of powder puffs, but they quickly become bedraggled by dew and showers.

Calliandra Quetzal Donn. Smith, Enum. Pl. Guat. 8: 36. 1907.
Anneslia Quetzal Donn. Smith, Bot. Gaz. 13: 28. 1888.

Quiché; Baja Verapaz, the type from Santa Rosa, 1,500 meters, *Tuerckheim* 1324.

A low glabrous shrub; stipules rounded or reniform, 1.5-3.5 cm. wide, persistent; leaves petiolate, the pinnae 1-3 pairs; leaflets 6-8 pairs, mostly oval, 2.5-3.5 cm. long, rounded or very obtuse at the apex, rounded or subcordate at the base, coriaceous, paler beneath; inflorescence terminal, elongate, 10-20 cm. long, the peduncles fasciculate, 1-2 cm. long; flowers 4-5 in each head or umbel, the pedicels 4-6 mm. long; calyx 4-6 mm. long, the lobes very obtuse; corolla 12-15 mm. long, the lobes lance-oblong, acute, venose; stamens 5-7 cm. long; legume 10 cm. long, 1.5 cm. wide near the apex, attenuate to the base, the valves coriaceous, their margins much thickened.

The species seems to be a very local and rare one. We have observed but not collected what is probably the same plant, in flower at the end of the dry season, on dry rocky hills above Salamá. The specific name is that of the national bird of Guatemala.

Calliandra rhodocephala Donn. Smith, Bot. Gaz. 49: 454. 1910 (type from Puerto Barrios, Izabal, *C. C. Deam* 6015). *Anneslia rhodocephala* Britt. & Rose, N. Amer. Fl. 23: 56. 1928.

Wet thickets or forest, at or near sea level; Izabal. British Honduras.

A shrub or small tree, sometimes 3-5 meters high but usually lower, with few branches, glabrous almost throughout but often with a few weak hairs on the young branchlets, leaf rachis, and peduncles; stipules lance-ovate, about 8 mm. long, striate, persistent, crowded at the bases of the branchlets; leaves on very short petioles, the pinnae 1 pair; leaflets 3 or 3½ pairs, lance-oblong to elliptic-lanceolate, 3-13 cm. long, 1.5-4.5 cm. wide, the lower ones much smaller than the upper ones, acute to long-acuminate, subcoriaceous, very lustrous, the venation conspicuous; peduncles solitary or fasciculate, mostly at the ends of the stout branches, 1-3 cm. long, the heads many-flowered; calyx 3 mm. long; corolla

8 mm. long; stamens bright red, 2.5 cm. long, very numerous, the tube slightly longer than the corolla.

A handsome and very showy shrub, occasional about Puerto Barrios, in pastures just back of the town, and collected also at Entre Ríos.

Calliandra tetragona (Willd.) Benth. in Hook. Journ. Bot. 2: 139. 1840. *Acacia tetragona* Willd. Sp. Pl. 4: 1069. 1806. *Anneslia tetragona* Donn. Smith, Enum. Pl. Guat. 1: 10. 1889. *C. portoricensis* var. *multijuga* Micheli in Donn. Smith, Bot. Gaz. 20: 285. 1895 (type from Casillas, Santa Rosa, *Heyde & Lux* 4148).

Moist or wet thickets, 200–1,500 meters; Alta Verapaz; Chiquimula; Santa Rosa; Escuintla; Retalhuleu. Southern Mexico; British Honduras; Honduras; Costa Rica; northwestern South America.

A shrub 2–3 meters high, often herbaceous almost throughout, the branches tetragonous, usually densely short-pilose; stipules lanceolate, striate, greenish, 6–8 mm. long; pinnae 4–7 pairs, the leaflets 15–25 pairs, oblong-linear, thin, 6–12 mm. long, obtuse or rounded at the apex, ciliate; peduncles axillary, solitary or fasciculate, 4–7 cm. long, the heads dense, many-flowered; calyx 3 mm. long, glabrous; corolla pale green, 6 mm. long, glabrous; stamens 4 cm. long, white, very numerous; legume 6–12 cm. long, 7–12 mm. wide, rounded at the apex, glabrous, containing numerous seeds, the valves rather thin, much thickened on the margins.

Distinguished from all other Guatemalan species by the conspicuously 4-sided stems.

Calliandra Tonduzii (Britt. & Rose) Standl. Field Mus. Bot. 4: 309. 1929. *Anneslia Tonduzii* Britt. & Rose, N. Amer. Fl. 23: 61. 1928 (type from Costa Rica). *A. chiapensis* Britt. & Rose, loc. cit. (type collected near Tapachula, Chiapas).

Most often on rocky stream banks, growing close to the water, 600 meters or less; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu; Quezaltenango. Oaxaca and Chiapas; Honduras; Costa Rica; Panama.

A shrub or small tree 4–7 meters high, with a depressed spreading crown, the branchlets sparsely pubescent or glabrate; stipules lanceolate, striate, persistent, 3–4 mm. long; petioles 1 cm. long or shorter, the pinnae 1 pair; leaflets 10–17 pairs, oblong or lance-oblong, 8–18 mm. long, acute or acutish, subcoriaceous, reticulate-veined, lustrous, glabrous or nearly so, ciliate; peduncles axillary, very short, the heads few-flowered; calyx 2 mm. long, glabrous or nearly so; corolla white, glabrous, 8 mm. long; stamens 4 cm. long, the filaments purple-red; legume 8–14 cm. long, 6–10 mm. wide, densely strigose with brownish or blackish hairs, the valves thick, the margins greatly thickened.

Britton and Rose are in error in describing the fruit as glabrous, although it does appear so to the naked eye. A specimen collected by Skutch (the specimen in the Herbarium of Chicago Museum bears an erroneous label) shows a curious abnormality, presumably teratological. While most of the flowers are normal, in a few the stamen tube is greatly elongate, about 2 cm. long, and trumpet-shaped, being dilated above to a breadth of about 8 mm., with the free filaments widely spaced along its margin. This is probably the species reported from Guatemala (Patulul) as *C. magdalenae* Benth.

Calliandra Wendlandii Benth. Trans. Linn. Soc. 30: 556. 1875.
Feuillea Wendlandii Kuntze, Rev. Gen. 1: 189. 1891. *Anneslia Wendlandii* Britt. & Rose, N. Amer. Fl. 23: 73. 1928.

Type said to have been collected in Guatemala by Wendland.

Similar in habit, pubescence, flowers, and fruit to *C. Houstoniana*, velutinous-villous; petioles 4-6 mm. long, the pinnae 1 pair, the leaflets numerous, linear, falcate, 4-6 mm. long; racemes elongate, thyrsiform, the flowers pedicellate, strigose-sericeous; stamens numerous, purple-red, 6-7.5 cm. long; legume thick, densely villous.

Known apparently only from the original collection, and we have seen no representation of the species, which should be easy of recognition. There is no certainty that it really is a Guatemalan plant.

DESMANTHUS Willdenow

Plants unarmed, herbaceous or suffrutescent, the branches angulate-striate; leaves bipinnate, the leaflets small and narrow, a gland present on the petiole between the lowest pair of pinnae; flowers capitate, small, the heads usually few-flowered, the peduncles axillary, solitary; flowers all perfect or the lowest sterile, sometimes apetalous, 5-parted, sessile; calyx campanulate, short-dentate; petals free or slightly coherent, valvate; stamens 10 or 5, free, exserted, the anthers eglandular; ovary subsessile, glabrous, many-ovulate, the style subulate or thickened above, the stigma terminal, small, concave; legume linear, straight or falcate, acute, compressed and flat, membranaceous-coriaceous, 2-valvate, continuous within or septate between the seeds; seeds longitudinal or oblique, ovate, compressed.

Bentham and Hooker estimated the number of species at 8, while Britton and Rose record 26 for North America, a rather excessively optimistic number. All are American, but one has become naturalized in tropical Asia. Only the following species is known from Central America.

Desmanthus virgatus (L.) Willd. Sp. Pl. 4: 1047. 1806.
Mimosa virgata L. Sp. Pl. 519. 1753. *D. depressus* Humb. & Bonpl.

ex Willd. Sp. Pl. 4: 1046. 1806. *Acuan virgatum* Medic. Theod. 62. 1786. *A. latum* Britt. & Rose, N. Amer. Fl. 23: 132. 1928. *Frijolillo*.

Moist or dry thickets, often in sandy fields or waste ground, sometimes along beaches or about salt flats, 800 meters or less; Petén; Zacapa; Jutiapa; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu. Florida; Texas; Mexico; British Honduras to Salvador and Panama; West Indies; South America; naturalized in tropical Asia.

Plants herbaceous or suffrutescent, variable in habit, often decumbent but frequently stiffly erect and a meter high, the stems glabrous or sparsely pubescent, often much branched; stipules setiform, 3-4 mm. long; leaves small, petiolate, the pinnae 1-7 pairs; leaflets 8-20 pairs, linear or linear-oblong, 3-9 mm. long, thin, usually glabrous, rounded and apiculate at the apex; peduncles 1-5 cm. long, glabrous or nearly so, the flowers whitish; stamens 10; calyx and corolla almost minute, glabrous; legumes few or several in each head, linear, straight or slightly curved, 3-8 cm. long, 3-5 mm. wide, acute or acuminate, the seeds oblique.

An inconspicuous weedy plant, often plentiful during the wet months. *D. depressus* has often been recognized as a distinct species, but we are in agreement with Fawcett and Rendle (Fl. Jam.), who were unable to find satisfactory characters for separating it from *D. virgatus*. Britton and Rose refer the forms we have placed here to three species, but the characters by which they attempt to key them are inconstant and untenable.

ENTADA Adanson

Woody vines, unarmed or aculeate; leaves bipinnate, sometimes tendrill-bearing at the apex, the leaflets large or small, numerous, the petioles without glands; stipules small, setaceous; flowers 5-parted, sessile, spicate, the spikes usually paniculate; calyx campanulate, shallowly dentate; petals free or slightly coherent, valvate; stamens 10, free, short-exserted, the anthers tipped with a deciduous gland; ovary subsessile, many-ovulate, the style filiform, the stigma terminal, truncate, concave; legume straight or arcuate, often gigantic, thin to coriaceous or ligneous, the sutures thickened, the valves articulate between the seeds; seeds orbicular.

Perhaps 15 species, in the tropics of both hemispheres, most of them in Africa. Only the following are known from continental North America. Britton and Rose placed each of the following species in a separate genus. It must be admitted that here as elsewhere in the Leguminosae some defense can be made of the generic segregations, but if the same process were applied throughout the family in all parts of the world, the number of minor genera would soon reach fantastic figures, and no practical advantage is to be gained by such a procedure.

Stems and leaves densely armed with recurved prickles. *E. patens*.

Stems and leaves unarmed.

Legume ligneous; leaves often ending in tendrils; flower spikes solitary or 2-3 together, extra-axillary. *E. phaseoloides*.

Legume chartaceous; leaves without tendrils; flower spikes in dense terminal racemes. *E. polystachia*.

Entada patens (Hook. & Arn.) Standl. Contr. U. S. Nat. Herb. 23: 349. 1922. *Inga patens* Hook. & Arn. Bot. Beechey Voy. 419. 1840. *Piptadenia patens* Benth. Bot. Voy. Sulph. 89. 1844. *Mimosa gualanensis* Rob. & Bartl. Proc. Amer. Acad. 43: 53. 1907 (type from Gualán, Zacapa, C. C. Deam 224). *Pseudoentada patens* Britt. & Rose, N. Amer. Fl. 23: 192. 1928. *Cola de iguana*.

Usually in dry thickets on plains or hillsides, 700 meters or less; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Suchitepéquez; Retalhuleu; San Marcos. Southern and western Mexico; Salvador; Nicaragua.

A small or large vine, the stems and leaf rachis densely armed with short recurved prickles, the young branches puberulent or glabrate; pinnae 2-4 pairs, the leaflets 3-6 pairs, orbicular to obovate, 1-5 cm. long, rounded at each end, glabrous above, paler beneath, usually pilose along the costa; inflorescence 20-30 cm. long, puberulent, the slender spikes racemose, 4-10 cm. long, the flowers creamy white, glabrous, 1.5 mm. long; stamens twice as long as the petals; legume flat and thin, 8-14 cm. long, 2-2.5 cm. wide, glabrous, the margins undulate and armed with small recurved prickles, the fruit stipitate.

Known in Salvador by the names "zarza de garrobo," "zarza diente de garrobo," and "gusanillo." The vine is abundant in thickets of the dry Pacific plains, where during the *verano* the many large pods are conspicuous. The plant is viciously armed and makes impenetrable the jungles in which it grows.

Entada phaseoloides (L.) Merrill, Philip. Journ. Sci. Bot. 9: 86. 1914. *Lens phaseoloides* L. in Stickm. Herb. Amboin. 18. 1754. *Mimosa gigas* L. Fl. Jam. 22. 1759. *M. scandens* L. Sp. Pl. ed. 2. 1501. 1763. *E. scandens* Benth. in Hook. Journ. Bot. 4: 332. 1841.

Wet lowland forest, at or little above sea level; Izabal. British Honduras to Panama; West Indies; South America; Old World tropics.

A large vine, often climbing to the tops of tall trees, glabrous almost throughout; leaves with 1-2 pairs of pinnae, often terminated by a tendril, especially on young branches; leaflets usually 4-5 pairs, oblong to oblong-obovate, asymmetric, 2-8 cm. long, obtuse or rounded at the apex and often emarginate; flowers fragrant, cream-colored, the spikes very long and dense, 1 cm. thick, short-pedunculate; calyx 1.5 mm. long; petals oblong, 3-4 mm. long; stamens 6-8 mm. long; legume

commonly 1-2 meters long and 8-10 cm. wide, blackish, curved, 10-12-seeded; seeds compressed, rounded, dark brown, smooth, 3-5 cm. in diameter.

This vine has probably the largest fruits of all Central American Leguminosae, being approached only by some *Inga* species. The large seeds are heavy but they contain a median air space that enables them to float. They are one of the so-called sea-beans, which sometimes are transported by ocean currents to very distant shores, a fact that doubtless explains the present wide distribution of the species, which is almost pantropic.

Entada polystachia (L.) DC. Mém. Lég. 434. 1825. *Mimosa polystachia* L. Sp. Pl. 520. 1753. *Entadopsis polystachia* Britton, N. Amer. Fl. 23: 191. 1928. *Lengua de buey*.

Dry to wet thickets or forest, 900 meters or less; Izabal; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Retalhuleu; San Marcos. Western and southern Mexico; British Honduras to Salvador and Panama; West Indies; South America.

Usually a large vine, the stems ochraceous, the young branches glabrous; pinnae 2-6 pairs, the leaflets 6-8 pairs, broadly oblong to obovate, 2-4 cm. long, rounded at the apex and base, subcoriaceous, green and lustrous above, glabrous, slightly paler beneath, glabrous or appressed-pilose on the nerves; flowers small and greenish, arranged in dense spikes 8-10 cm. long, these forming a very large and often dense raceme; calyx truncate, glabrous, 0.5 mm. long; petals 1 mm. long, glabrous; legume oblong, 20-40 cm. long, 5-8 cm. wide, very thin, lustrous, many-seeded, the exocarp separating in age as a thin papery sheet; seeds compressed, 1 cm. long.

Known in Salvador as "quiamol" and "cola de zorrillo"; "bejuco de amole," "bejuco de mondongo" (Tabasco). Pieces of the roots and stems macerated in water give a lather like that of soap. In Salvador and probably also in eastern Guatemala it is used for washing the hair, there being a popular belief that this makes the hair curly or wavy. The local name of Guatemala refers to the form of the large thin pods. The vine is extremely abundant on the Pacific plains, and conspicuous during the dry season because of the numerous dry pods that wave and rattle in the wind.

ENTEROLOBIUM Martius

Unarmed trees; leaves bipinnate, the pinnae and leaflets numerous pairs; stipules small and inconspicuous; peduncles solitary or subfasciculate, axillary or the upper ones forming a short raceme; flowers small, whitish, sessile in globose heads, 5-parted; calyx campanulate, shallowly dentate; corolla funnelform, the petals connate to the middle, valvate; stamens numerous, connate into a tube at

the base, exserted, the anthers small; ovary sessile, many-ovulate, the style filiform, the stigma small, terminal; legume broad, compressed, coiled or incurved-reniform, hard, indehiscent, septate within between the seeds; seeds transverse, compressed, on a filiform funicle.

The number of species is uncertain, but there are perhaps 4-5, the following in Mexico and Central America, the others South American.

Leaf rachis and peduncles glabrous or sparsely puberulent; leaflets 8-15 mm. long; legume 8-10 cm. broad.....*E. cyclocarpum*.
 Leaf rachis and peduncles densely ferruginous-puberulent; leaflets 3-5 mm. long; legume 5 cm. broad.....*E. Schomburgkii*.

Enterolobium cyclocarpum (Jacq.) Griseb. Fl. Brit. W. Ind. 226. 1860. *Mimosa cyclocarpa* Jacq. Fragm. Bot. 30. 1801. *Conacaste*; *Guanacaste* (sometimes written Huanacaste); *Pit* (Petatán, Huehuetenango).

Common on the Pacific plains, in forest or pastures, also plentiful in the lower Motagua Valley, on dry hillsides or along streams, chiefly at 300 meters or less; Petén; Alta Verapaz; Baja Verapaz; El Progreso; Izabal; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Suchitepéquez; Retalhuleu; San Marcos. Western and southern Mexico; British Honduras to Salvador and Panama; Jamaica and Cuba; northern South America.

A giant tree, often 30-35 meters high, the trunk thick, sometimes 2-3 meters in diameter, the crown broad and spreading, the trunk often supported by buttresses, the bark light greenish brown or brown with lighter-colored excrescences; petiole usually bearing a sessile gland, the pinnae 5-15 pairs; leaflets 20-30 pairs, linear-oblong, mostly 8-15 mm. long, acute, glabrous or sparsely appressed-pilose, pale beneath; peduncles slender, 1.5-4 cm. long, the heads dense and many-flowered, 1-1.5 cm. in diameter; calyx 2.5 mm. long, densely puberulent; corolla twice as long as the calyx, whitish, puberulent or glabrate; stamen tube included, the filaments long-exserted; legume 3-4 cm. wide, curved to form an almost complete circle 8-10 cm. in diameter, dark brown, very lustrous.

Called "tubroos" in British Honduras; "pich" (Yucatan, Maya); "piche" (Tabasco). The name of this tree gives its name to the Province of Guanacaste in Costa Rica. In Guatemala the usual name for *Enterolobium* is "conacaste." The term "orejas de conacaste" is sometimes applied there to very large human ears. El Conacaste is the name of a *caserío* in El Progreso and of another in Escuintla. The term is of Nahuatl derivation, signifying "ear-tree." This is one of the four or five largest trees of all Central America and one of the best known. Many individual trees are true giants, rivaling the ceibas. The conacaste is abundant over the Pacific

plains, but it rarely if ever extends into the hills. It sometimes grows in forests, although seedlings appear rather intolerant of shade and seem to develop better in the open. The leaflets fold together at night. Wherever there are cattle pastures, the trees are sure to be found, and the cattle and other stock seem to show a preference for the shade of the tree, probably on account of the fallen foliage and pods, both of which they eat greedily. Although extremely broad, the crown of the tree is not dense. The foliage is graceful and fern-like and pleasing in appearance, especially when the fresh new leaves are developing toward the end of the dry season. A few trees have been planted in Guatemala City, and there doubtless are others in localities where the species is not native. There is a tree in the park at Puerto Barrios. The pulp of the pods is sometimes used in Guatemala as a soap substitute, especially in washing textiles. The pulp is said to be eaten sometimes in Honduras and elsewhere in time of famine. In Salvador it is forbidden to throw sawdust from the wood into streams, because it kills cattle and fish. Throughout the range of the tree, apparently, the gum produced on its trunk is employed as a remedy for affections of the chest.

The wood of the conacaste is walnut-brown or often with various shadings, sometimes with a reddish tinge, with a rather high luster; sapwood dull white, merging gradually into the heartwood; without distinctive odor or taste; very light, soft and spongy to moderately hard and firm, the specific gravity 0.35–0.60; weight 22–37 pounds per cubic foot; grain straight to somewhat roey; texture medium to coarse; very easy to work; the harder kinds take a good polish; readily seasoned without warping or checking; fairly durable. Some conacaste timber reaches the United States. The heavier material resembles walnut (*Juglans*) in general appearance, and is a fairly satisfactory substitute for it. It has been used to a considerable extent in California cities for interior trim in residences and office buildings. In Central America the wood is highly esteemed for all sorts of construction purposes and for fuel. From it are made the mortars used for hulling rice and coffee, the omnipresent washboards or trays, and dugout canoes, often very large ones. For construction purposes it is considered about as good as cedro (*Cedrela*), and it is valued especially because it is little injured by dampness and is not attacked by *comején* (termites).

Enterolobium Schomburgkii Benth. Trans. Linn. Soc. 30: 599. 1875. *Pithecolobium Schomburgkii* Benth. Lond. Journ. Bot. 3: 219. 1842. *Guanacaste*.

Known in Guatemala only from Río Diéguez, Dept. Guatemala, 1,200 meters, *Heyde & Lux* 4470. Oaxaca; Panama; Guianas and Brazil.

A tall tree, 12-20 meters high, the crown broad and spreading, the trunk not buttressed, 50 cm. or more in diameter, the bark moderately smooth or fissured, exuding a small amount of translucent yellow sap when cut, slightly scaly, grayish; branchlets, petioles, leaf rachis, and peduncles densely ferruginous-puberulent; petioles 2-4 cm. long, bearing a sessile cupular gland; pinnae 10-20 pairs; leaflets 40-60 pairs, linear-falcate, crowded, 2-4 mm. long, obtuse or rounded at the apex, lustrous on the upper surface, glabrous or nearly so; peduncles 2.5 cm. long or shorter; calyx 2 mm. long, the corolla twice as long; legume about 5 cm. broad, somewhat ligneous, ferruginous, glabrous.

Called "guanacastillo" in Oaxaca. The sapwood is oatmeal color, the heartwood hard and durable. The wood is used in Oaxaca for railroad ties, posts, and bridge and house construction. The tree must be rare in Guatemala for we have not seen it anywhere. In Panama and Oaxaca this is a lowland tree, and it would not ordinarily be expected at such a high elevation as that reported for Guatemala. We should be inclined to suspect that the tree was planted in Guatemala if it were not for a recent collection of the species that has been made in Oaxaca.

INGA Willdenow

References: Henry Pittier, Preliminary revision of the genus *Inga*, Contr. U. S. Nat. Herb. 18: 173-223. pls. 81-105. 1916. The Middle American species of the genus *Inga*, Journ. Dept. Agr. Porto Rico 13: 117-177. pls. 13-31. 1929.

Unarmed shrubs or large trees; stipules small and caducous, or sometimes large, lanceolate, and persistent; leaves even-pinnate, the leaflets usually few and large, the petiole and rachis often winged, large glands usually present on the rachis between each pair of leaflets; flowers large for the Mimoseae, mostly white or whitish, in globose heads or umbels or in short or elongate spikes, the inflorescences axillary or paniculate at the ends of the branches; flowers 5-parted; calyx tubular or campanulate, dentate or shallowly lobate; corolla tubular or funnelform, the petals united to the middle or higher, valvate; stamens numerous, long-exserted, connate only at the base, or much higher to form an elongate tube, the anthers small; ovary sessile, few-many-ovulate, the style subulate, the stigma terminal, small or capitate; legume linear, straight or somewhat curved, compressed and flat, tetragonous, or subterete, woody to coriaceous, tardily if at all dehiscent, the sutures often thickened or dilated and sulcate; seeds usually surrounded by juicy white pulp.

Species 150 or probably more, in tropical America. Numerous others occur in southern Central America.

Rachis of the leaf not winged or marginate.

Flowers capitate or umbellate.

Flowers short-pedicellate or almost sessile; calyx and corolla glabrous or nearly so.....*I. Paterno.*

Flowers long-pedicellate; calyx and corolla densely pilose....*I. Roussouviana.*

Flowers in short or elongate spikes.

Leaflets 5-6 pairs, densely pubescent beneath.

Legume broad, flat, compressed; leaflets very lustrous on the upper surface, not softly pubescent beneath.....*I. Recordii.*

Legume subterete or tetragonous, as thick as broad; leaflets not lustrous on the upper surface, densely soft-pubescent beneath....*I. multijuga.*

Leaflets 1-4 pairs, often almost glabrous, sometimes abundantly pubescent.

Leaflets densely pubescent, even in age; legume densely hirsute.

I. pinetorum.

Leaflets glabrous or glabrate; legume not hirsute.

Calyx only 1-1.5 mm. long.....*I. belizensis.*

Calyx usually 2.5-4 mm. long.

Calyx and corolla glabrous; flower spikes very slender, elongate, lax.

I. laurina.

Calyx and corolla densely pubescent; flower spikes dense, stout, short.

Leaflets 2 pairs.....*I. punctata.*

Leaflets 3 pairs.....*I. leptoloba.*

Rachis of the leaf winged or marginate, usually very broadly so.

Leaflets glabrous or nearly so; calyx 1 mm. long; spikes very lax and interrupted.

I. marginata.

Leaflets abundantly pubescent, usually densely so; calyx more than 1 mm. long, usually much longer; flower spikes usually dense, rarely lax and interrupted.

Peduncles and young branchlets densely hirsute with long spreading hairs; leaflets 2-3 pairs.

Flowers pedicellate, racemose.....*I. Cookii.*

Flowers sessile, spicate.

Leaflets cuneately narrowed to the base; corolla about 8 mm. long.

I. subvestita.

Leaflets rounded at the base; corolla 20 mm. long.....*I. Lindeniana.*

Peduncles and young branches not hirsute, usually densely brownish-tomentose.

Flowers small, the calyx usually 4-7 mm. long.

Corolla 15-18 mm. long; leaflets 4-6 pairs.....*I. edulis.*

Corolla 10-13 mm. long; leaflets 3-4 pairs.....*I. Micheliana.*

Flowers larger, the calyx 10-30 mm. long.

Calyx 2-3 cm. long; leaflets 5-7 pairs.

Leaflets 7 pairs.....*I. Donnell-Smithii.*

Leaflets 5-6 pairs.....*I. fissicalyx.*

Calyx 1-1.5 cm. long.

Corolla 2.5-3 cm. long; bracts persistent, conspicuous.

I. Rodrigueziana.

Corolla 13-20 mm. long; bracts deciduous, inconspicuous....*I. spuria.*

Inga belizensis Standl. Field Mus. Bot. 4: 307. 1929.

Wet forest, at or little above sea level; Izabal. British Honduras, the type from Mullins River road, *W. A. Schipp* 24.

A tree of 12-17 meters, the trunk 15 cm. or more in diameter, the branchlets puberulent at first; leaves short-petiolate, the rachis naked or obscurely marginate; leaflets 3 pairs, subsessile, lance-oblong to oblanceolate-oblong or obovate-oblong, 5.5-8 cm. long, 2-3.5 cm. wide, abruptly acuminate, with an obtuse or acute tip, cuneately narrowed to the base, glabrous, at least in age; flowers spicate, the spikes fasciculate in the leaf axils, 1-2 cm. long, dense and many-flowered, head-like, long-pedunculate; bracts minute, shorter than the calyx; calyx minutely puberulent, 1-1.3 mm. long, minutely dentate; corolla 5 mm. long, glabrous or puberulent only at the apex; stamens white, 12 mm. long; legume 11-14 cm. long, 2 cm. wide, strongly compressed and flat, glabrous, sessile, broadly rounded at the apex, the margins strongly thickened.

Inga Cookii Pittier, Contr. U. S. Nat. Herb. 18: 203. 1916; Journ. Dept. Agr. Porto Rico 13: 148. *pl.* 31. 1939. *Chochoc*; *Paterno*; *Machetón*; *Cujiniquil*; *Palat* (Cobán, Quecchí).

Moist or wet forest, often in open pine forest, 200-1,500 meters; endemic; Alta Verapaz (type from Finca Sepacuité, *O. F. Cook* & *R. F. Griggs* 202); Izabal.

A shrub or small tree, sometimes 6 meters high and probably attaining a greater size, the branchlets densely hirsute with long spreading brown hairs; petiole and rachis broadly winged, hirsute; leaflets 3 pairs, sessile, ovate to oblong-lanceolate, 5-21 cm. long, acuminate or narrowly long-acuminate, rounded or obtuse at the base, very lustrous above when fresh, sparsely or densely long-hirsute, in age sometimes glabrate, somewhat paler beneath, brownish when dried, sparsely or densely brown-hirsute; racemes axillary, solitary, long-pedunculate, slender, the bractlets lanceolate, 2-4 mm. long; flowers few and remote, on pedicels 2.5 mm. long; calyx tubular, 4 mm. long, hirtellous; corolla 11 mm. long, hirsute, the lobes short and narrow; stamen tube included; ovary glabrous; fruit strongly compressed, 2-ridged along each margin, glabrous, about 21 cm. long and 3.5 cm. wide.

Inga Donnell-Smithii Pittier, Contr. U. S. Nat. Herb. 18: 211. 1916.

Type from Guarda Viejo, Guatemala City, 1,500 meters, *J. D. Smith* 2316; not definitely known otherwise.

Branchlets densely brownish-tomentose; leaves almost sessile, the rachis broadly winged; leaflets 7 pairs, coriaceous, subsessile, lance-oblong, 5-14 cm. long, 1-3 cm. wide, sparsely appressed-pilose on both surfaces, paler beneath, the costa rufous-tomentose; flowers spicate, the spikes axillary, solitary, few-flowered, the flowers sessile; bracts ovate, acute, 6-10 mm. long, deciduous; calyx stout, densely rufous-tomentose, 19-21 mm. long; corolla densely rufous-pilose, 22 mm. long, the lobes ovate, acute; stamen tube included; ovary villous at the base; legume unknown.

The status of this species is questionable. In the end it probably will be found synonymous with some of the older Mexican ones. The type collection was once reported from Guatemala as *I. eriocarpa* Benth.

Inga edulis Mart. Flora 20, Beibl. 113. 1837. *Quijinicuil* (fide Aguilar); *Uatop, Bitze* (Petén, fide Lundell).

Moist, wet, or sometimes rather dry forest, or in open places, 1,500 meters or less; Petén; Alta Verapaz; Retalhuleu; Quezaltenango. Southern Mexico; British Honduras to Salvador and Panama; southward to Brazil.

A tree with spreading crown, sometimes 20 meters high, the branchlets ferruginous-tomentose; leaf rachis narrowly or rather broadly winged, the glands large, sessile, the petiole naked; leaflets 3-6 pairs, usually 4 pairs, subcoriaceous, sessile, ovate to elliptic or lance-oblong, 5-19 cm. long, 2-10 cm. wide, acute or acuminate, rounded at the base, scaberulous or velutinous above, sparsely or densely short-pilose beneath; flowers spicate, the spikes axillary, solitary or fasciculate, on peduncles 2-6 cm. long, usually dense; bracts ovate or lanceolate, shorter than the calyx, deciduous; calyx appressed-pilose with mostly grayish pubescence, 6-7 mm. long; corolla sericeous-villous, 15 mm. long; stamen tube short-exserted; legume subterete or somewhat tetragonous, 15-60 cm. long, 1.5-2 cm. thick or more, densely brown-tomentulose, on a short thick peduncle or almost sessile.

Known in Salvador as "pepetón"; "guama," "guama pachona," "guajiniquil" (Honduras); "guamo," "bribri" (British Honduras). In Salvador this species is much planted for coffee shade, but it seems to be used little if at all for that purpose in Guatemala. The specific name *edulis* alludes to the fact that the pulp about the seeds is edible, but in Central America it is eaten much less than that of the species having large flat pods, which yield a pulp of greatly superior quality.

Inga fissicalyx Pittier, Contr. U. S. Nat. Herb. 18: 213. 1916. *Cuje* (Zacapa).

Wet forest or along streams, 600 meters or less; Alta Verapaz; Izabal; Zacapa. Southern Mexico.

A tree with spreading crown, seldom more than 10 meters high, the branchlets densely brown-tomentose, likewise the inflorescence; leaves short-petiolate, the petiole naked, the rachis narrowly winged; stipules ovate, 10-12 mm. long, caducous; leaflets 5-6 pairs, subsessile, subcoriaceous, lance-oblong or oblanceolate, 5-11 cm. long, 1.5-3.5 cm. wide, acute or short-acuminate, somewhat narrowed to the obtuse or narrowly rounded base, short-pilose above with spreading or subappressed, yellowish hairs, densely and rather softly pilose beneath; flowers spicate, the spikes axillary, geminate, on peduncles 5-7 cm. long, dense, few-flowered; bracts lanceolate, 1 cm. long, caducous; calyx 20-28 mm. long, very

densely brownish-pilose or tomentose, the teeth long and narrow; corolla softly villous, 18-23 mm. long, the lobes short and broad; legume 15 cm. long, 1 cm. thick, subterete and costate, densely brown-tomentose, the sides somewhat flattened.

Known in Tabasco by the names "bitze," "chelele," and "guatope." Like most of the species that have been described in recent years in this group with subterete or tetragonous pods, this one is of very doubtful standing. When ampler material is available from Guatemala and southern Mexico, it is probable that most of the recent species can be reduced conveniently to synonymy under the older ones described from Mexico. *I. fissicalyx* is known in Veracruz by the name "acotope." The pulp surrounding the seeds is edible. The sapwood is creamy white, the heartwood pale brown, often with a pinkish tinge after exposure. It is utilized only for firewood.

Inga laurina (Swartz) Willd. Sp. Pl. 4: 1018. 1906. *Mimosa laurina* Swartz, Prodr. Veg. Ind. Occ. 85. 1788. *Palal* (fide Aguilar).

Dry rocky thickets or thin forest, 700 meters or less; Escuintla; Retalhuleu. Western Mexico; Salvador; Panama; West Indies.

A small tree, commonly 8-9 meters high, with a broad crown, glabrous throughout or nearly so; leaf rachis naked, with small cupular glands between each pair of leaflets, slender; leaflets 1-3 pairs, subcoriaceous, obliquely ovate or obovate, sometimes elliptic, 4-14 cm. long, 1.5-4.5 cm. wide, acute or obtuse, usually with an obtuse tip, cuneately narrowed at the base; flowers spicate, the spikes axillary or terminal, solitary or geminate, 4-15 cm. long, lax and rather remotely flowered; flowers sessile or subsessile, white, fragrant; calyx tubular, glabrous or nearly so, 4-5 mm. long; corolla tubular-campanulate, 4-5 mm. long, the stamen tube long-exserted; legume flat and strongly compressed, glabrous or almost so, 7-15 cm. long, 2-3.5 cm. wide, sessile, broadly rounded at the apex, the margins strongly thickened.

Called "cujincuil" and "paternillo" in Salvador. In this species and related ones, with small, strongly compressed pods, there is no edible pulp about the seeds.

Inga leptoloba Schlecht. Linnaea 12: 560. 1838. *Nacaspiro*; *Paternillo* (Petén); *Cuje* (Alta Verapaz); *Pepeto*; *Paterno* (Huehuetenango); *Cerel*, *Cerelillo* (Izabal); *Bitze* (Petén, Maya).

Moist forest or on rather open hillsides, 1,500 meters or less; Petén; Alta Verapaz; Izabal; Santa Rosa; Escuintla; Chimaltenango; Suchitepéquez; Huehuetenango; Quezaltenango; San Marcos. Southern Mexico; British Honduras to Salvador and Panama.

A tree with spreading or rounded crown, sometimes 18 meters high with a trunk 60 cm. in diameter, the bark light brown, the branchlets glabrous or nearly

so; stipules subulate, deciduous, 3–4 mm. long; petiole and rachis of the leaf naked, the glands obsolete or sometimes present and large; leaflets 3 pairs, short-petiolulate, coriaceous, ovate-elliptic to lance-oblong, mostly 5–10 cm. long and 1–4.5 cm. wide, sometimes larger, acute to long-acuminate, usually cuneate at the base, glabrous or sparsely strigose; flowers spicate, the spikes axillary and fasciculate or terminal and paniculate, 2–6 cm. long, dense, on peduncles 1.5–5 cm. long or more; bracts subulate, less than half as long as the calyx; calyx tubular, 4.5–6 mm. long, pubescent; corolla 6.5–10 mm. long, sericeous; stamens white, the tube equaling the corolla or slightly exserted; ovary glabrous; legume compressed and flat, 6–18 cm. long, 2–2.5 cm. wide, glabrous, rounded at the apex, stipitate, cuneate at the base, the edges thickened; seeds 3–20, immersed in scant pulp.

Called “pepeto” and “pepeto negro” in Salvador; “acotope” (Veracruz). It is questionable whether this is distinct from *I. punctata*. It is much planted for coffee shade in Guatemala and elsewhere in Central America.

Inga Lindeniana Benth. Lond. Journ. Bot. 4: 608. 1845.
Paterno.

Quezaltenango, in forest, 1,200–1,300 meters; probably also Huehuetenango, 1,500 meters. Type from Teapa, Tabasco; Honduras(?).

Branchlets densely rufous-hirsute; leaf rachis broadly winged, the wings attenuate at each end, hirsute; leaflets 3 pairs, membranaceous, sessile, ovate to broadly elliptic, somewhat oblique, as much as 25 cm. long and 12 cm. wide, abruptly short-acuminate, rounded at the base, setose-hirsute on both surfaces; flowers spicate, the spikes oblong, rather lax and few-flowered, pedunculate; bracts linear-lanceolate, caducous; calyx tubular, conspicuously striate, pubescent, 1 cm. long; corolla sericeous-villous, 23 mm. long; legume strongly compressed and flat at first, 15–30 cm. long or more, 5–6.5 cm. wide, twisted when ripening, densely rufous-villous.

The Guatemalan collections are sterile and their determination therefore is somewhat uncertain, but they agree better with this species than with any other of which we have seen material.

Inga marginata Willd. Sp. Pl. 4: 1015. 1806.

Moist forest, or in coffee plantations, 1,400 meters or less; Suchitepéquez; Quezaltenango. Costa Rica; Panama; Colombia.

A small or medium-sized tree, glabrous almost throughout; petiole marginate or narrowly winged, the rachis short, narrowly winged; leaflets usually 2 pairs, sessile, coriaceous or thick-membranaceous, oblong-lanceolate or obovate-oblong, 6–12 cm. long, 2–4 cm. wide, generally long-acuminate, cuneate at the base; flowers spicate, the spikes slender, lax, interrupted, 5–10 cm. long, short-pedunculate, the flowers sessile or nearly so; calyx 1.5 mm. long, almost glabrous; corolla white, campanulate, 4 mm. long, the stamen tube long-exserted; legume sessile, compressed, thickened about the seeds, 5–12 cm. long, about 1.5 cm. wide, glabrous.

This is sometimes planted for coffee shade, as at Finca Pirineos in Quezaltenango.

Inga Micheliana Harms, Repert. Sp. Nov. 13: 525. 1915 (type from Río Negro, Quiché, 1,080 meters, *Heyde & Lux* 3319). *I. cobanensis* Pittier, Contr. U. S. Nat. Herb. 18: 188. 1916 (type from Cobán, Alta Verapaz, 1,450 meters, *Tuerckheim* 1214). *I. Tuerckheimii* Pittier, op. cit. 192. 1916 (based on the same collection as *I. cobanensis*). *Cushín*; *Chalúm*; *Shalúm*; *Chochoc* (Cobán, Quecchi).

Moist or wet forest, sometimes in thickets or open fields, often planted for coffee shade, chiefly at 800–1,800 meters; Alta Verapaz; Izabal(?); Escuintla; Sacatepéquez; Chimaltenango; Sololá; Quezaltenango; perhaps endemic, but to be expected in Chiapas.

A tree with spreading crown, commonly 6–10 meters high, sometimes larger, the branchlets densely tomentose or velutinous with short rufous hairs; petiole naked, the rachis broadly winged, the glands large and cupular; leaflets 3–4 pairs, subsessile, rather thick, lanceolate to oblong, elliptic, or obovate, 5–20 cm. long, acute or obtuse and apiculate, rounded at the base, softly pilose above, densely so on the costa, or in age glabrate, often lustrous, brownish beneath when dried, densely short-villous; flowers spicate, the spikes fasciculate, pedunculate, short, dense, few-many-flowered; calyx 4–5 mm. long, rufous-villous; corolla 10–11 mm. long, densely villous, the stamen tube included; legume 12–21 cm. long or longer, subterete, twisted, densely brown-tomentulose, appearing multicostate, the valves very narrow, their margins greatly dilated and longitudinally striate.

This species has been listed from Guatemala as *I. disticha* Mart. It is much planted in Guatemala as shade for coffee. *Inga* trees are considered throughout Central America the best trees for coffee shade and several species of them are used. They have on their roots nitrogen-fixing bacteria that enrich the soil and promote the growth of the coffee bushes. A large, clean *cafetal* with shade wholly of one species of *Inga* is a handsome sight, viewed from above or from the ground; the trees, of approximately the same height, form a dense canopy of green some distance above the tops of the coffee bushes. The vernacular names of the *Inga* species are none too well fixed in Guatemala, but this is probably the one most generally known by the name “cushín.” Its leaflets are much used at Cobán for wrapping the small *tamales* or *tamalitos*, imparting to them a purple color that is much admired. The flowers are said to give a good grade of honey, and many stands of bees may be seen about *cafetales* provided with *Inga* shade. Large amounts of excellent honey are produced in Guatemala, and in recent years substantial quantities have been exported to Europe.

Inga multijuga Benth. Trans. Linn. Soc. 30: 615. 1875. *Nacastro*; *Cuje*.

Wet forest, most often along stream banks, 350 meters or less; Alta Verapaz; Izabal. Honduras; Panama.

A tree with spreading crown, commonly 10 meters high or less, the branchlets densely rufous-tomentose; petiole and rachis naked, densely rufous-tomentose, the glands small, subsessile; leaflets rather thick, 5-10 pairs, short-petiolulate, ovate to oblong or oblong-elliptic, 5-17 cm. long, 1.5-6 cm. wide, acute or acuminate, sometimes obtuse and apiculate, rounded or obtuse at the base, densely rough-pubescent above, densely velutinous-pubescent beneath; flowers spicate, the peduncles axillary, usually geminate or fasciculate, 2-3 cm. long or longer, the spikes short, ovoid; calyx 5-8 mm. long, striate, brownish-tomentulose; corolla sericeous, 2.5 cm. long; legume 15-25 cm. long, 1 cm. thick, densely brown-tomentulose, subterete, sessile, twisted in age, the valves very narrow, their edges greatly thickened, expanded, and costate.

Called "guamo" in Honduras. This term and "guavo," applied commonly to *Inga* species along the Atlantic coast of Costa Rica and Panama, are believed to be of Antillean origin.

Inga Paterno Harms, Repert. Sp. Nov. 13: 419. 1914. *Paterno*; *Paterna*.

Wet to rather dry forest, sometimes in thickets, frequently planted as coffee shade, 2,000 meters or less; Petén; Alta Verapaz; El Progreso; Santa Rosa; Guatemala; Quiché; Suchitupéquez; Quezaltenango; San Marcos. Southern Mexico; Salvador; Costa Rica.

A small or medium-sized tree, the branchlets glabrous; leaves glabrous or nearly so, the petiole and rachis naked; stipules obovate to oblong, 1.5-2 cm. long, sometimes persistent; leaflets 3-5 pairs, petiolulate, elliptic to ovate-lanceolate or oblanceolate-oblong, 5-17 cm. long, 2-6 cm. wide, acute or obtusely acuminate, rounded to narrowly cuneate at the base; peduncles glabrous, slender, 3-7 cm. long, mostly terminal and paniculate, the flowers pedicellate, umbellate; calyx tubular, 1-2.5 mm. long, somewhat pubescent; corolla glabrous, 3.5-7.5 mm. long; stamen tube included; legume rather long-stipitate, asymmetric, 9-12 cm. long, 4-5 cm. wide, strongly compressed and flat, rounded at the apex, glabrate.

Sometimes called "guama" in Salvador. The origin of the name "paterno" is unknown. A *caserío* of Jalapa is called El Paterno, and this species probably grows in that department. The pulp surrounding the seeds is eaten commonly. In Salvador the cotyledons are removed from the seeds, cooked, blanched, salted, and eaten as a salad. It is stated that the cotyledons only of this species are treated thus. The species has been reported from Guatemala as *I. Jinicuil* Schlecht., a Mexican species, *I. stipularis* DC., and *I. cordistipula* Benth.

Inga pinetorum Pittier, Contr. U. S. Nat. Herb. 18: 185. pl. 90. 1916.

British Honduras, the type from Manatee Lagoon, on pine ridge, *M. E. Peck* 343; Tabasco.

A shrub or small tree, 5 meters high or less, the branchlets densely ferruginous-hispidulous; petiole and leaf rachis naked, densely ferruginous-hispidulous, the glands very small, urceolate; leaflets 2 pairs, almost sessile, obovate to elliptic-oblong, 4-12 cm. long, 2-6.5 cm. wide, rounded or very obtuse at the apex and apiculate, cuneate at the base, subcoriaceous, hispidulous or velutinous-pilose on both surfaces, often densely so, the pubescence fulvous or brownish; flowers spicate, the peduncles 4-6.5 cm. long, geminate or fasciculate in the leaf axils, the spikes short and dense; calyx tubular, densely pilose with ascending hairs; corolla 12 mm. long, densely sericeous, the lobes short, narrow, acute; stamen tube slightly exserted; legume very small (in the specimens seen), 4.5-5 cm. long, 2.5 cm. wide, strongly compressed, densely hirsute or hispidulous with fulvous stiff hairs, broadly rounded at the base, sessile, obliquely rounded at the apex, the margins of the valves somewhat thickened; seeds about 5.

Inga punctata Willd. Sp. Pl. 4: 1016. 1806. *Caspiro*; *Nacaspiro*; *Cuajiniquil*; *Cuajiniquil blanco*; *Ixcapirol*; *Bitze* (Petén, Maya).

Moist or rather dry forest, or on brushy plains, 1,150 meters or less; Alta Verapaz; Izabal; Sololá; Retalhuleu; Huehuetenango; Quezaltenango; doubtless also in San Marcos. Chiapas; Tabasco; British Honduras to Salvador and Panama; Venezuela.

A tree with broad crown, usually 10 meters high or less, the branchlets glabrous or nearly so; petiole and leaf rachis naked, glabrate; leaflets 2 pairs, short-petiolulate, subcoriaceous, obliquely oblong or elliptic-lanceolate to elliptic or elliptic-obovate, mostly 7-12 cm. long, subacute to abruptly acuminate, cuneate at the base, sparsely pubescent when young but in age glabrous or nearly so; stipules subulate, 6 mm. long; flowers spicate, the spikes solitary or fasciculate, about 3 cm. long, the peduncles sparsely pubescent, 1-2 cm. long; calyx tubular, puberulent, 2.5-3.5 mm. long; corolla sericeous-pilose, 6.5-7.5 mm. long, the stamen tube slightly exserted; legume sessile or short-stipitate, straight or somewhat curved, rounded at each end, strongly compressed, 6-18 cm. long, 2-2.5 cm. wide, pubescent at first but in age glabrate, the margins strongly thickened.

Sometimes called "pepeto" in Salvador; "guama" (Honduras).

Inga Recordii Britt. & Rose in Standl. Trop. Woods 7: 5. 1926. *Guamo macho*.

Wet forest, often in wooded swamps, 300 meters or less; Alta Verapaz; Izabal. British Honduras (type from Stann Creek District, *S. J. Record*).

A tree of 6-12 meters with spreading crown, the trunk often 15 cm. or more in diameter, the branchlets densely puberulent; petiole and leaf rachis naked,

puberulent-tomentulose, the glands large, cupular; leaflets 5-6 pairs, short-petiolulate, subcoriaceous, oblong-lanceolate or the lowest oblong-ovate, 5-13 cm. long, acute or acuminate, obliquely rounded at the base, lustrous above and white-punctate, pubescent along the nerves, paler beneath, pubescent with very short, subappressed, yellowish hairs; flowers spicate, the spikes fasciculate in the leaf axils or forming terminal panicles, 2-4 cm. long, dense and many-flowered, on peduncles 1-2 cm. long; bracts minute; calyx 4-5 mm. long, strigose; corolla about 18 mm. long, strigose, the stamen sheath included; legume straight or somewhat curved, strongly compressed, about 12 cm. long and 2 cm. wide, rounded at the base, sessile, short-rostrate at the apex, densely fulvous-puberulent, the margins strongly thickened.

Known in British Honduras by the names "bribri," "bribri macho," and "tamatama." The wood is brownish gray or somewhat pinkish, hard, heavy, straight-grained, rather fine-textured, not durable. As in other species of the genus, the wood is used only for firewood.

Inga Rodrigueziana Pittier, Contr. U. S. Nat. Herb. 18: 209. 1916. *Shalum*; *Cushin* (Chimaltenango); *Paterna* (Sacatepéquez); *Guamo*, *Cujinicuil* (North Coast).

Wet to dry forest, sometimes in open fields, abundantly planted for coffee shade; 300-1,800 meters (probably only planted above 1,000 meters); Alta Verapaz; El Progreso; Izabal; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Quezaltenango. Chiapas.

A medium-sized or large tree with flat spreading crown, often 12 meters high or more, the branchlets densely hirtellous with fulvous or ferruginous hairs; stipules ovate, 7 mm. long, deciduous; petiole usually naked, the rachis narrowly or rather broadly winged, the glands large and conspicuous; leaflets 3-4 pairs, large and rather thin, almost sessile, elliptic-ovate to lance-elliptic or elliptic, mostly 10-20 cm. long and 5-10 cm. wide, acute or acuminate, rounded at the base, pilose or glabrate above, densely soft-pilose beneath; flowers spicate, the spikes mostly solitary in the leaf axils, 3-5 cm. long, on peduncles 2-5 cm. long; bracts linear-lanceolate, 1-2 cm. long, conspicuous, somewhat persistent, often green; calyx striate, pale, short-pilose, about 1.5 cm. long; corolla 2 cm. long, sericeous-pilose, the stamen tube slightly exserted; legume 12-30 cm. long or often longer, 3-3.5 cm. broad or more, compressed but in cross section oblong-quadrangular, the margins deeply sulcate and costate, the edges of the valves almost wing-like, the whole pod glabrous or nearly so, green, rounded and often short-rostrate at the apex, sessile.

Called "bribri" and "tamatama" in British Honduras; "chalum colorado" (Chiapas). This species has been reported from Guatemala as *I. insignis* Kunth and *I. Pittieri* Micheli. The shalum tree is well known in central Guatemala and along the Pacific foothills, where it is abundantly planted as coffee shade. It also makes good shade for cacao, and has been planted for that purpose in Izabal.

It is probably the species most grown in Guatemala to shade coffee, especially in the Pacific bocacosta, where there are countless thousands of the trees. In the central uplands it is planted but little, but some of the *cafetales* about Antigua and in Chimaltenango are shaded with it. The pods are larger than those of other local species, and they contain a rather large amount of crisp, juicy, sweetish, white pulp about the large seeds. They are used much more than those of any other species, and very large numbers of them are consumed. When the pods are ripe, the opened and stripped ones may be found anywhere along the roadsides through the coffee regions, and in greater quantities in the *cafetales*. They are carried up to the highlands in large numbers for sale in the markets, and may even be seen at times placed upon the table in the smaller hotels at noon as a dessert fruit. The proper vernacular name for this species is "shalúm," probably of Mayan origin but, as with other species, local people seem to have almost as much difficulty as botanists in distinguishing the species (this one is easily recognized by its fruits), and at Quezaltenango the fruits of *I. Rodrigueziana* are offered also under the names "cushín" or "cuxín," "caspirol," and "paterna."

Inga Roussoviana Pittier, Contr. U. S. Nat. Herb. 18: 175. pl. 82. 1916. *I. Schippii* Standl. Field Mus. Bot. 11: 132. 1932 (type from Banana Bank, base of Cockscomb Mountains, W. A. Schipp 538).

Moist or wet forest. 650 meters or less; Petén. Southern Mexico; British Honduras; Honduras; Costa Rica; Panama.

A tree as much as 12 meters high, the trunk to 25 cm. in diameter, the branchlets and inflorescence ferruginous-tomentose; petiole and leaf rachis naked, tomentulose or glabrate; leaflets 3-4 pairs, obovate to oblong, short-petiolulate, 5-15 cm. long, 2.5-8 cm. wide, acute or subobtusate, cuneate at the base, in age glabrous or nearly so; flowers umbellate, the umbels paniculate, many-flowered, on peduncles 1-3.5 cm. long, the pedicels slender, densely pubescent, 4-10 mm. long; calyx narrow, 5 mm. long, densely sordid-pubescent; corolla 9-11 mm. long, densely pilose, the stamen tube included or slightly exerted; legume compressed, 11-17 cm. long, 2-2.5 cm. wide, ferruginous-pubescent, rounded at the base, apiculate, the margins thickened.

Inga spuria Humb. & Bonpl. ex Willd. Sp. Pl. 4: 1011. 1806. *Cuajinicuil*; *Cujinicuil*; *Cojinicuil*; *Cuje*; *Guamo* (Izabal); *Shalúm*; *Chalúm*; *Abitz* (Petén, Maya); *Cushe*.

Moist to wet or dry forest, sometimes in wooded swamps or in open fields, frequent along stream banks, 1,600 meters or less,

mostly at 900 meters or lower; Petén; Alta Verapaz; Izabal; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Suchitopéquez; Retalhuleu; Huehuetenango; Quezaltenango. Southern Mexico; British Honduras to Salvador and Panama; northern South America.

A small or medium-sized tree, frequently 15 meters high, sometimes flowering when only a shrub of 2 meters, the branchlets short-pilose or somewhat tomentose with grayish or fulvous hairs; petiole very short or almost none, the leaf rachis rather broadly winged, the glands orbicular, sessile, large and conspicuous; leaflets 5-7 pairs, almost sessile, oblong-ovate to elliptic-oblong or lance-oblong, 5-15 cm. long, 2-8 cm. wide, subacuminate to obtuse, rounded or obtuse at the base, somewhat lustrous above, hirtellous or glabrate, densely and softly pubescent beneath or rarely glabrate; flowers spicate, the spikes axillary, mostly geminate, 2-4 cm. long, dense and few-many-flowered, the peduncles 2-4 cm. long; bracts small, ovate, deciduous; calyx 1.5 cm. long, appressed-pilose; corolla 2 cm. long, sericeous-pilose, the stamen sheath scarcely exerted; legume subterete or somewhat tetragonous, densely fulvous-tomentulose, 5-30 cm. long, 1-1.5 cm. in diameter, the valves very narrow, the margins much thickened, sulcate, expanded over the sides of the valves.

Known in Salvador by the names "nacaspilo," "pepeto," "pepetillo," "cujín," "pepete," and "pepito"; "bribri" (British Honduras). This has been reported from Guatemala as *I. vera* Willd. Pittier reports from Guatemala (Lago de Amatitlán) *I. xalapensis* Benth., but all related material that we have seen can be referred quite satisfactorily to *I. spuria*, of which *I. xalapensis* is quite possibly a synonym. This species sometimes is planted for coffee shade, but less frequently than some of the species previously mentioned. The pulp about the seeds is edible. The name Cuje has been given to a *caserio* of Jutiapa. The *cabecera* of Santa Rosa, Cuilapa, also owes its name to this species of *Inga*. Its name was formerly Cuajiniquilapa, meaning "place where *Inga* trees grow," but the government, with some reasonable basis, decided that the name was too long, and shortened it to Cuilapa, which has no significance at all, etymologically. The name cuajinicuil and its variants are of Nahuatl derivation. Britton and Rose key out this species as having pedicellate flowers, but ordinarily it requires a good imagination to find the pedicels. Most often the flowers are quite sessile but they sometimes are short-pedicellate, especially the lowest flowers of each spike.

Inga subvestita Standl. Field Mus. Bot. 22: 27. 1940.

Wet mixed forest, 1,100 meters or less; endemic; Alta Verapaz (type collected above Finca Transvaal, C. L. Wilson 315); Izabal.

A shrub or small tree, the branches often tortuous, densely hispid with long spreading hairs; petiole and leaf rachis broadly winged, hirsute; leaflets usually 2-3 pairs, sometimes only 1 pair, membranaceous, oblong-obovate or elliptic-oblong, 5-9 cm. long, 2-4 cm. wide, mostly acute or acuminate, cuneate-acute and oblique at the base, sparsely hispid above, long-ciliate, mostly densely hispid beneath; flowers spicate, the spikes axillary, lax, with few or numerous flowers, about 3.5 cm. long, the peduncles 2-3.5 cm. long, the flowers sessile, the rachis densely brown-hispid; bracts linear-subulate, 2-3 mm. long, persistent; calyx 3 mm. long, hispid with long spreading rufous hairs; corolla striate, 12 mm. long, rather sparsely hispid; legume unknown.

It is questionable whether this is distinct from *I. Cookii*, but the flowers are clearly sessile, while in *I. Cookii* they are described as pedicellate.

LEUCAENA Bentham

Unarmed trees or shrubs; leaves bipinnate, the leaves small and very numerous or large and few, the petiole usually with a gland; stipules setaceous or small; flowers capitate, white, the heads globose, many-flowered, the peduncles axillary and fasciculate or the upper ones in terminal naked racemes; peduncle bearing 2 bracts at or below its apex; flowers 5-parted, sessile; calyx tubular-campanulate, dentate; petals free, valvate; stamens 10, free, exserted, the anthers ovate, oblong, or globose, often pilose, eglandular; ovary stipitate, many-ovulate, the style filiform, the stigma small, terminal; legume stipitate, broadly linear, compressed and flat, rigid-membranaceous, 2-valvate, continuous within; seeds transverse, usually oblique, ovate, compressed.

About 50 species have been described, almost 40 of them from North America. The true number occurring in tropical North America is probably less than half as many.

Leaflets oblong, mostly 1.5-2 cm. long and 5-8 mm. wide..... *L. Shannoni*.

Leaflets linear-oblong, mostly less than 1.5 cm. long and 4 mm. wide.

Leaflets mostly 8-14 mm. long, glaucescent..... *L. glauca*.

Leaflets mostly 4-7 mm. long, not glaucescent.

Leaflets densely pubescent beneath and usually also on the upper surface.
L. guatemalensis.

Leaflets ciliate, otherwise glabrous or nearly so.

Bracts inserted at the apex of the peduncle; pinnae 10-25 pairs.

L. brachycarpa.

Bracts inserted below the apex of the peduncle; pinnae mostly fewer than 10 pairs..... *L. diversifolia*.

Leucaena brachycarpa Urban, Symb. Antill. 2: 265. 1900.
L. Standleyi Britt. & Rose, N. Amer. Fl. 23: 128. 1928. *Guaje*.

Brushy, rocky slopes, 400-1,500 meters; Chiquimula; Jalapa; Jutiapa; Huehuetenango. Southern Mexico; Salvador.

A tree of 5–8 meters, the branches ferruginous, the young branchlets and leaf rachis sparsely puberulent; gland of the petiole large and conspicuous, oval or orbicular, depressed or cupular; leaves large, short-petiolate, the pinnae 10–25 pairs; leaflets 25–50 pairs, linear, 4–5 mm. long, ciliate, when young puberulent but quickly glabrate, acute, the costa central or somewhat excentric; peduncles solitary or fasciculate, 1–2 cm. long, the bracts inserted at the apex, appressed; flowers strigillose, the calyx 2 mm. long; petals 4 mm. long; legume 6–12 cm. long, 1.5–1.8 cm. wide, apiculate, puberulent or glabrate, narrowed at the base to a stipe 6–10 mm. long.

Known in Salvador as “guaje,” a term derived from the Nahuatl name, *huaxin*, from which it is believed that Oaxaca, Mexico, derives its name.

Leucaena diversifolia (Schlecht.) Benth. in Hook. Journ. Bot. 4: 417. 1842. *Acacia diversifolia* Schlecht. Linnaea 12: 570. 1838.

Brushy, rocky hillsides, 200–400 meters; Zacapa; Chiquimula. Southern Mexico.

A tree 15 meters high, the branchlets and leaf rachis puberulent; stipules triangular-subulate, 5 mm. long; petiolar gland suborbicular, cupular, inserted just below the lowest pinnae; petiole short, the pinnae 15 pairs or usually 10 or fewer; leaflets 20–50 pairs, linear, 4–6 mm. long, ciliate but otherwise glabrous or nearly so, subacute or obtuse, subfalcate; peduncles solitary or geminate, 1–2 cm. long, the involucre inserted 3 mm. below the apex; flowers glabrous, the corolla slightly longer than the calyx; legume linear, puberulent, 7–14 cm. long, obtuse or acute, 1–1.5 cm. wide, the stipe 6–8 mm. long.

The single Guatemalan collection is in fruit, and its determination is not altogether certain.

Leucaena glauca (L.) Benth. in Hook. Journ. Bot. 4: 416. 1842. *Mimosa glauca* L. Sp. Pl. 520. 1753. *Barba de león* (Huehuetenango).

Moist thickets, often in second growth, 1,400 meters or less; Huehuetenango (Cumbre Papal, *Steyermark* 50928). British Honduras; southern Florida; southern Mexico; West Indies; northern South America; naturalized in the Old World tropics.

A shrub or small tree, sometimes 10 meters high, the branchlets and leaf rachis whitish-puberulent; leaves petiolate, the pinnae 3–10 pairs, the petiole with a gland or eglandular; leaflets 10–20 pairs, very pale, linear-oblong or lanceolate, 8–15 mm. long, acute, glabrous or nearly so; peduncles axillary and terminal, usually fasciculate, 2–3 cm. long, the heads 1.5–3 cm. in diameter; calyx puberulent, 1 mm. long, the teeth obtuse; petals pubescent; legume linear, 10–15 cm. long, 1.5 cm. wide, densely puberulent, abruptly acute or mucronate, attenuate below to a stout stipe.

Called “wild tamarind” in British Honduras; “uaxim,” “guaje” (Yucatan). There is a prevalent belief in tropical America that if

horses, mules. or pigs eat any part of the tree, their hair will fall out, but that cattle and goats are not affected. The wood is hard, close-grained, and light brown.

Leucaena guatemalensis Britt. & Rose, N. Amer. Fl. 23: 126. 1928. *Yaje*; *Quiebrahacha*.

Chiefly on dry, brushy, often rocky slopes or plains, 200–2,100 meters; Zacapa; Guatemala (type collected on plains near Guatemala, *Sutton Hayes* 23); Sacatepéquez; Quezaltenango; endemic.

A large shrub or a small tree, usually 5–12 meters high, the branchlets, peduncles, and leaf rachis densely puberulent; stipules subulate from a triangular base, 6–8 mm. long; petiolar gland cupular, suborbicular, borne below the lowest pinnae, the pinnae 12–15 pairs; leaflets 25–35 pairs, linear, 3–5 mm. long, subacute, puberulent above, densely pubescent beneath; peduncle 1–2.5 cm. long, the bracts inserted at its apex, the flowers glabrous; bractlets peltate, long-stipitate, puberulent; legume 7–12 cm. long, 1.5–2 cm. wide, rounded to subacute at the apex, narrowed below to a stipe 1 cm. long or shorter, lustrous, puberulent or glabrate.

Britton and Rose describe the pubescence as “villous,” which is highly misleading. The pubescence on all parts consists of very short hairs that by no stretching of the term can be called villous.

Leucaena Shannoni Donn. Smith, Bot. Gaz. 57: 419. 1914 (type from Cojutepeque, Salvador). *L. salvadorensis* Standl. ex Britt. & Rose, N. Amer. Fl. 23: 125. 1928 (type from Jocoro, Morazán, Salvador). *Guaje*.

Dry, brushy plains or rocky hillsides, 900–1,000 meters; Chiquimula; Jutiapa. Chiapas; Honduras; Salvador; Nicaragua.

A tree of 7–12 meters, the branchlets and leaf rachis sparsely puberulent or glabrate; petiolar gland oblong; pinnae 4–6 pairs; leaflets 9–17 pairs, oblong to elliptic-obovate, 12–22 mm. long, 5–8 mm. wide, obtuse or rounded at the apex, glabrous or sparsely pilose, reticulate-veined; peduncles 1–2.5 cm. long, usually forming long racemes, the heads globose, very dense, the bractlets orbiculate-peltate, long-stipitate, puberulent; flowers glabrous, the calyx 2 mm. long; petals 3 mm. long; legume linear, 10–18 cm. long, 1.5–2.5 cm. wide, acute at the base and short-stipitate, densely velutinous-puberulent.

Called “guaje” in Salvador.

LYSILOMA Bentham

Unarmed shrubs or trees; leaves bipinnate, the leaflets generally small and very numerous, the petiole usually with a conspicuous gland; flowers small, in globose heads or in spikes, 5-parted, polygamous; calyx campanulate, shallowly dentate; corolla funnelform-campanulate, the lobes valvate; stamens numerous,

mostly 12-30, rather long-exserted, connate at the base into a short tube, the anthers minute; ovary sessile or short-stipitate, many-ovulate, the style subulate, the stigma small, terminal; legume linear or broader, generally straight, compressed and flat, almost membranaceous, the valves separating at maturity from the persistent continuous margin, not septate within; seeds transverse, ovate, compressed.

Perhaps 30 species, in tropical America. One or two other species may occur in Central America.

Flowers spicate or racemose.

Spikes very short, oval or subglobose, but the flowers scattered along an evident rachis. *L. auritum*.

Spikes much elongate, almost linear.

Flowers sessile. *L. desmostachys*.

Flowers pedicellate. *L. acapulcense*.

Flowers capitate, the flowers all attached at the end of the rachis.

Leaflets 8-15 mm. long. *L. bahamense*.

Leaflets mostly 3-7 mm. long.

Leaflets pubescent, at least on the lower surface. *L. Kellermanii*.

Leaflets glabrous, but more or less ciliate. *L. multifoliolatum*.

Lysiloma acapulcense (Kunth) Benth. Lond. Journ. Bot. 3: 83. 1844. *Acacia acapulcensis* Kunth, Mimos. 78. 1819.

Only one Guatemalan collection seen definitely referable here, Dept. Guatemala, *Ignacio Aguilar* 413; reported from other departments, perhaps incorrectly, but to be expected anywhere along the Pacific foothills. Central and southwestern Mexico.

A tree of 8-12 meters, the branchlets densely short-pilose or glabrate; stipules apparently very small or caducous; petiole bearing a depressed, oval or orbicular, rather large gland; pinnae about 9 pairs, the rachises velutinous-pilosulous; leaflets 35-45 pairs, linear-oblong, 4-7 mm. long, obtuse or acute, glabrous, ciliate, sometimes paler beneath; spikes solitary or clustered, often very numerous, pedunculate, 2-5 cm. long, dense, many-flowered, the flowers conspicuously pedicellate; calyx minute, puberulent; corolla glabrous or sericeous, 2-3 times as long as the calyx; ovary glabrous; legume glabrous, 12-22 cm. long, 2.5-3 cm. wide, blackish.

Known in Salvador by the names "quebracho colorado" and "sicahuite." A decoction of the bark is employed there as a domestic remedy for dysentery.

Lysiloma auritum (Schlecht.) Benth. Lond. Journ. Bot. 3: 83. 1844. *Acacia aurita* Schlecht. Linnaea 12: 572. 1838. *Sare blanco*.

Moist thickets or often on dry, rocky, or thinly forested hillsides, sometimes in open pine forest, 1,800 meters or less; Alta Verapaz;

Baja Verapaz; Jalapa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Sololá. Southern Mexico; Honduras; Salvador; Nicaragua.

A tree of 6-12 meters or reported as sometimes 25 meters high, the crown flat or open, the bark light brown, sometimes curling up in large scales, the trunk sometimes with small buttresses, the young branchlets densely short-pilose; petioles short, bearing a conspicuous elevated gland; stipules large, thin, obliquely ovate, 1-3 cm. long, acute or obtuse, deciduous, very conspicuous; pinnae 10-25 pairs; leaflets 25-50 pairs, oblong-linear, 4-5 mm. long, obtuse, glabrous but usually ciliate, often conspicuously so; peduncles axillary, solitary or fasciculate, 3 cm. long or shorter; racemes very short, 1-1.5 cm. long, oval, the flowers distinctly pedicellate, densely puberulent; calyx 2 mm. long, the white corolla 3-4 mm. long; legume short-stipitate, 12-16 cm. long, 8-8.5 cm. wide, blackish or dark ferruginous, glabrous, rostrate.

Called "sicahuite" or "sicagüite" in Salvador; "chicharrón" (Veracruz). The sapwood is described as thick and whitish, the heartwood almost black with broad grayish bands. In Mexico the wood is used locally for house construction, but it is said to be susceptible to attacks of termites. In Salvador the bark is used for tanning hides, but it is reported to impart to them an unpleasant butyric odor.

Lysiloma bahamense Benth. Lond. Journ. Bot. 3: 82. 1844.
Tzalam (Petén, fide Lundell).

Along lake shores, 300 meters or less; Petén. Southern Florida; West Indies; Yucatan; British Honduras.

A tree, sometimes 15 meters high with a trunk 50 cm. in diameter, the bark at first smooth and gray, splitting into scales, the branchlets slender, glabrous; stipules ovate, caducous; leaves large, the petiole bearing a large gland below the lowest pinnae, these 2-5 pairs; leaflets 10-30 pairs, oblong, sessile, 8-15 mm. long, obtuse, glabrous; flowers whitish, in dense globose heads, these long-pedunculate, racemose; calyx campanulate, 1 mm. long, the corolla twice as long, with reflexed lobes, puberulent; legume linear-oblong, 8-15 cm. long, 2-2.5 cm. wide, glabrous; seeds dark brown, lustrous, flat, 12 mm. long.

Called "salom" in British Honduras, presumably of Maya derivation; "tzucte" (Yucatan, Maya).

Lysiloma desmostachys Benth. Lond. Journ. Bot. 3: 84. 1844.
Acacia desmostachys Benth. Pl. Hartweg. 13. 1839. *Acacia usumacintensis* Lundell, Contr. Univ. Mich. Herb. 4: 8. 1940. *Zupte* (Petén, Maya, fide Lundell).

Chiefly on dry, often rocky, brushy or thinly forested hillsides, 100-1,400 meters; Petén; Baja Verapaz; Izabal; Chiquimula; Jalapa; Jutiapa. Southern Mexico; British Honduras; Salvador.

A tree of 15 meters or less, the branchlets and leaf rachis densely short-pilose; stipules small or caducous; petiole bearing one or more elevated glands, the pinnae 7-15 pairs; leaflets 40-60 pairs, linear-oblong, 3-5 mm. long, obtuse or subacute, glabrous or nearly so, ciliate; flowers spicate, the spikes axillary, solitary or fasciculate, often very numerous, dense, slender-pedunculate, the flowers sessile, white; calyx densely pubescent, 1-1.5 mm. long; corolla densely pubescent, twice as long as the calyx; legume linear-oblong, glabrous, stipitate, 12-20 cm. long, 3-3.5 cm. wide, ferruginous, acute at the base.

Known in British Honduras by the names "wild tamarind" and "hesmo."

Lysiloma Kellermanii Britt. & Rose, N. Amer. Fl. 23: 81. 1928. *Guaje; Pisquín de río* (fide Aguilar).

Wooded rocky stream banks or on dry brushy hillsides, 300-1,700 meters; Baja Verapaz; El Progreso (type from El Rancho, W. A. Kellerman 7745); Zacapa; Jalapa; Guatemala; Chimaltenango; Quiché. Chiapas.

A tree of 8-12 meters with spreading crown, the branchlets and leaf rachises densely short-pilose or almost glabrous; stipules apparently early caducous; petiole bearing a large cupular gland above the middle, the pinnae commonly 4-5 pairs; leaflets about 25 pairs, linear-oblong, 3-5 mm. long or slightly larger, obtuse or rounded at the apex, rather densely pubescent on both surfaces; peduncles 2-3 cm. long in anthesis, more or less elongate in fruit; legume linear-oblong, 11-16 cm. long, 2-2.8 cm. wide, glabrous, ferruginous, acute or obtuse, acute at the base and stipitate.

Lysiloma multifoliolatum Britt. & Rose, N. Amer. Fl. 23: 84. 1928. *Zorro*.

Thinly forested hillsides, 1,300-1,500 meters; Quezaltenango (southern slopes of Volcán de Santa María, between Finca Pirineos and Los Positos, Steyermark 33778). Chiapas; Salvador (type from Zacatecoluca).

A tree of 6-15 meters with broad spreading crown, the young branchlets, petioles, leaf rachises, and peduncles densely short-pilose; stipules lanceolate, 1-1.5 cm. long, caducous; petiole bearing a rather large, elevated gland, the pinnae 15-25 pairs; leaflets 40-50 pairs or sometimes fewer, oblong-linear, 2.5-4 mm. long, obtuse, glabrous, ciliate; peduncles solitary or geminate, 1.5-3 cm. long, the heads globose, the flowers short-pedicellate, white, densely puberulent; calyx 1 mm. long, the corolla 2.5 mm. long; legume ferruginous, 9 cm. long or more, 2-2.5 cm. wide, acute at the base, long-stipitate, glabrous, lustrous.

This is probably the species that has been noted by the writers as common in the bocacosta of San Marcos, where some of the larger trees must be 30 meters tall.

MIMOSA L.

Herbs, shrubs, or trees, sometimes woody vines, usually aculeate; leaves bipinnate, often sensitive, the petioles usually eglandular; flowers 4-5-parted or sometimes 3- or 6-parted, perfect or polygamous, small, in globose heads or cylindric spikes, the peduncles axillary, solitary or fasciculate, the upper ones sometimes racemose; calyx generally minute, short-dentate; petals more or less connate, valvate; stamens as many as the petals or twice as many, free, long-exserted, the anthers small, eglandular; ovary sessile or rarely stipitate, 2-many-ovulate, the style filiform, the stigma small, terminal; legume oblong or linear, usually compressed and flat, membranaceous or coriaceous, the 2 valves separating from the persistent continuous margin, commonly transverse-articulate, sometimes continuous, continuous or subseptate within; seeds compressed, ovate or orbicular.

About 400 species, most abundant in tropical and warmer regions of America, but extending also to Africa and Asia. Additional ones are known from southern Central America.

Valves of the legume continuous, not separating into joints, usually densely aculeate or hispid on the margins.

Plants erect; legume 1.5-2 cm. wide *M. platycarpa*.

Plants scandent; legume about 1 cm. wide or narrower.

Leaflets 15-25 pairs, 1 mm. wide *M. Donnell-Smithii*.

Leaflets 7-11 pairs, mostly 6-8 mm. wide *M. canahuensis*.

Valves of the fruit separating at maturity into joints.

Flowers spicate *M. guatemalensis*.

Flowers capitate.

Pinnae 1 pair, the leaflets 1-2 pairs, large.

Branches densely pubescent *M. albida*.

Branches glabrous or nearly so.

Leaflets obtuse or rounded at the apex, or some of them acute; petioles with only a few weak prickles *M. sesquijugata*.

Leaflets acute or usually acuminate; petioles densely armed with stout recurved prickles.

Legume densely pilose and setose-aculeate *M. Maxonii*.

Legume setose-aculeate but otherwise glabrous *M. Velloziana*.

Pinnae 1-many pairs, the leaflets 3-many pairs, large or small.

Legume broadly winged on both margins, the wings lacerate; tree of the Petén region *M. hemiendytia*.

Legume not winged.

Leaflets large, all or most of them 1 cm. wide or often 4-5 cm. wide; woody vines, the branches and petioles densely recurved-aculeate; petiole usually bearing 1 or more glands.

Leaflets usually 3 pairs, sparsely granular-resiniferous beneath, mostly 2-4 cm. wide *M. resinifera*.

Leaflets 5-many pairs, usually not granular-resiniferous, often smaller.

Leaflets acute, glabrous on the upper surface or nearly so.

M. hondurana.

Leaflets rounded or very obtuse at the apex, often copiously pubescent on the upper surface.

Leaflets usually 3 pairs, the upper ones mostly 2-3.5 cm. wide.
M. Watsonii.

Leaflets mostly 6 or more pairs, little more than 1 cm. wide.
M. Recordii.

Leaflets small, less than 1 cm. wide and often only 1-3 mm. wide; plants various in habit; petiole always or nearly always eglandular.

Plants unarmed; a tall tree, cultivated. *M. Bracaatinga.*

Plants usually aculeate, never trees; native species.

Stems conspicuously 4-6-angulate, sparsely or usually very densely beset with short recurved prickles.

Branches glabrous *M. pinetorum.*

Branches densely pilose or puberulent.

Leaflets 7-9 mm. long; a large, woody vine. *M. scalpens.*

Leaflets 3-5 mm. long; plants chiefly herbaceous, procumbent or scandent. *M. invisa.*

Stems terete or nearly so, not acutely angulate, armed with straight or recurved prickles or sometimes unarmed.

Plants densely pubescent with long spreading gland-tipped hairs.
M. somnians.

Plants without gland-tipped hairs.

Plants herbaceous or suffrutescent; stamens as many as the corolla lobes; pinnae 1-3 pairs.

Leaflets obovate or oval, setose-hirsute. *M. Skinneri.*

Leaflets linear-oblong, not hirsute.

Pinnae remote on the leaf rachis. *M. teledactyla.*

Pinnae crowded at the end of the leaf rachis. *M. pudica.*

Plants conspicuously woody shrubs or trees; stamens as many as the corolla lobes or twice as many; pinnae often many pairs.

Pinnae 1 pair. *M. zacapana.*

Pinnae numerous pairs.

Joints of the legume numerous. *M. pigra.*

Joints of the legume 2-3. *M. dormiens.*

Mimosa albida Humb. & Bonpl. ex Willd. Sp. Pl. 4: 1030. 1806. *Zarza viva*; *Zarza*; *Sensitiva*; *Calarcuac*, *Cuarakix* (Cobán, Quecchí).

Moist or dry, often rocky thickets, often on brushy or open hillsides or in fields or pastures, frequently in oak forest, frequent in second growth, 2,100 meters or less; Alta Verapaz; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; San Marcos. Mexico; Honduras; Costa Rica; ranging southward to Peru.

An erect shrub, 3 meters high or less, sometimes depressed and prostrate, abundantly armed on stems and petioles with stout recurved prickles, the branches densely hispidulous or pilose, the pubescence variable in quality; leaves petiolate,

the pinnae 1 pair; leaflets 2 pairs, the lower inner one much smaller, the others variable in shape, obovate to oblong, very asymmetric, 3-8 cm. long, acute to rounded at the apex, usually mucronate, obliquely rounded or obtuse at the base, covered on both surfaces with slender fine soft whitish hairs, often also setose-strigose beneath; flowers pink or pale pink, in dense globose heads, these axillary or in terminal racemes, on peduncles 1-3 cm. long; calyx minute, the corolla puberulent on the lobes; stamens as many as the corolla lobes; legume narrowly oblong, 1-3 cm. long, 5-7 mm. wide, subsessile, densely pubescent and short-setulose, the joints usually 3-6.

Sometimes called "zarza blanca" and "comida de venado" in Salvador. This plant in its various forms is one of the most common and widely distributed shrubs of Central America, and it probably occurs in all the departments of Guatemala. It is of a decidedly weedy nature, and often occurs abundantly on overgrazed land, forming dense thickets that are all but impassable because of the abundance of hooked prickles. The species is a highly variable one, especially in pubescence, and several of the forms have been described in the past as species. All these are reduced by Britton and Rose to synonymy under *M. albida*, but they were recognized as varieties by Robinson in his more critical account of the group, and are so treated here. At first glance the differences between the varieties—chiefly variations in pubescence—are so striking that one would be inclined to consider them distinct species, but there are occasional intergrading forms, making such segregation impractical.

Mimosa albida* var. *floribunda (Willd.) Robinson, Proc. Amer. Acad. 33: 311. 1898. *M. floribunda* Willd. Sp. Pl. 4: 1031. 1806.

Moist or dry thickets or open forest, frequent in pine or oak forest, often in second growth, 1,000-2,400 meters; Zacapa; Chiquimula; Sacatepéquez; Chimaltenango; Quiché; Huehuetenango; Quezaltenango; San Marcos. British Honduras; distribution like that of the species.

Distinguished by having the leaflets glabrous or practically so on the upper surface, covered beneath with closely appressed setae; corolla puberulent or tomentulose; stems densely pubescent.

Mimosa albida* var. *glabrior Robinson, Proc. Amer. Acad. 33: 311. 1898.

Type from Malpaís, Santa Rosa, 1,200 meters, *Heyde & Lux* 4133.

Branches almost glabrous; leaflets glabrous above, sparsely setose beneath; corolla glabrous. We have seen no collections refer-

able to this variety. It was reported by Captain Smith as *M. Velloziana* Benth.

Mimosa albida var. **strigosa** (Willd.) Robinson, Proc. Amer. Acad. 33: 311. 1898. *M. strigosa* Willd. Sp. Pl. 4: 1030. 1806. *Zarza negra*; *Zarza casco de vaca*.

Moist or wet thickets, sometimes in savannas, 1,400 meters or less; Petén; Izabal; Jalapa; Huehuetenango. British Honduras; Costa Rica; South America.

Leaflets densely setose-strigose on both surfaces, the hairs usually rather long and closely appressed, those of the upper surface sometimes very short. The Maya name of Yucatan is reported as "heech-beech."

Mimosa Bracaatinga Hoehne, A Bracaatinga ou Abaracaatinga 23. ill. 1930.

Native of southern Brazil; cultivated occasionally in Guatemala, as in Guatemala and near Quezaltenango, and planted as coffee shade in one or more *fincas* of Escuintla (Finca El Zapote).

A tall shrub or a slender tree, sometimes 15 meters high, with a rather sparse, broad crown, the trunk branching shortly above the base, the bark whitish; young branchlets densely lepidote, unarmed; leaves small, the pinnae mostly 5-7 pairs; leaflets 25-35 pairs, oblong-linear, obtuse, stellate-tomentulose, especially beneath; peduncles subterminal or axillary, solitary or fasciculate, 1.5 cm. long; flowers white, in globose heads, these 7 mm. in diameter; calyx glabrous, 1.2 mm. long; corolla 4-lobate, stellate-tomentulose, 3.5 mm. long; stamens 4; legume sessile, oblong-linear, obtuse, densely verrucose-tomentose, 2-2.5 cm. long, 5-6 mm. wide, with 2-4 joints; seeds castaneous, 3-4 mm. long.

The bracaatinga has been much advertised in tropical America in recent years as a tree suitable for reforestation. Its principal virtue seems to be that it grows rapidly and could be used to reforest land temporarily until better trees could take its place. Its wood is much used in its native region for firewood, especially for railway locomotives, and it might be valuable for paper-making. In Guatemala it grows rapidly under as different conditions as those on the Pacific foothills and the bleak plains of Quezaltenango (at 2,400 meters). The coffee plantations shaded by bracaatinga are very handsome, for the trees are uniform in height, their crowns far above the coffee bushes. We have no information as to whether the tree has been found satisfactory in other respects as coffee shade.

Mimosa canahuensis Standl. & Steyer. Field Mus. Bot. 23: 163. 1944.

Known only from the type, El Progreso, Montaña Canahui, between Finca San Miguel and summit of mountain, near upper limits of Finca Caieta, 1,600–2,200 meters, *Steyermark* 43758.

A woody vine, the branches obtusely angulate, densely pilosulous and hispidulous, abundantly armed with short recurved brownish broad-based prickles; leaves large, 15–20 cm. long, the rachis densely aculeolate and sordid-pubescent, the pinnae 4–6 pairs, 4.5–7.5 cm. long; leaflets 7–11 pairs, thick-membranaceous, oval-oblong or suboval, 14–19 mm. long, 5–8 mm. wide, rounded or very obtuse at the apex, obliquely rounded at the base, deep green and puberulent on the upper surface, paler beneath and softly pilosulous, penninerved; peduncles axillary, bearing a single head of flowers, stout, 1.5 cm. long, aculeolate above; legumes several in each head, sessile or nearly so, about 2 cm. long and 8–9 mm. wide, rounded at base and apex, densely setose, the bristles pale yellowish, 2–3 mm. long, the margins thickened, densely setose, the valves continuous, not articulate.

Mimosa Donnell-Smithii (Britt. & Rose) Standl. & Steyer. Field Mus. Bot. 23: 163. 1944. *Neomimosa Donnell-Smithii* Britt. & Rose, N. Amer. Fl. 23: 173. 1928.

Type from Cubilgüitz, Alta Verapaz, 350 meters, *Tuerckheim* 8197.

A woody vine, the branches angulate, pubescent, bearing numerous small reflexed prickles; leaves large, the petiole and rachis pubescent and aculeate, the pinnae 5–8 pairs; leaflets 15–25 pairs, linear-oblong, 6–8 mm. long, 1 mm. wide, pubescent on both surfaces; inflorescence paniculate, the peduncles 1–2 cm. long, pubescent; legume oblong, 5–6 cm. long, 1 cm. wide, long-stipitate, puberulent when young, attenuate at the apex, the margins and stipe aculeate.

We have seen no representation of this species.

Mimosa dormiens Humb. & Bonpl. ex Willd. Sp. Pl. 4: 1035. 1806.

Collected in Chiapas at Tapachula, and doubtless to be found in San Marcos or elsewhere in Guatemala; Chiapas to Costa Rica; South America.

A usually prostrate shrub, forming large dense mats, the branches strigose, bearing numerous straight prickles; stipules ovate, acuminate, long-ciliate; petiole and leaf rachis strigose, bearing numerous slender straight prickles; pinnae 3–6 pairs, the leaflets 6–20 pairs, oblong, obtuse, 4–8 mm. long, 1 mm. wide; peduncles axillary, 2 cm. long or shorter; flowers pink, capitate, 4-parted; stamens 8; legume obovate, about 12 mm. long and 8 mm. wide, obliquely truncate, pubescent and setose, the articulations only 2 or 3.

Mimosa guatemalensis (Hook. & Arn.) Benth. Bot. Voy. Sulph. 89. 1844. *Inga guatemalensis* Hook. & Arn. Bot. Beechey Voy. 419. 1841.

Reported rather vaguely from Guatemala, and to be expected there. Western Mexico; Nicaragua, the type from Realejo.

A shrub or small tree, 5 meters high or less, the branches densely pilose-tomentose with whitish hairs, usually armed with numerous coarse broad-based prickles; pinnae 3-6 pairs; leaflets 3-6 pairs, elliptic to obovate, 1-2 cm. long, 4-18 mm. wide, densely pilose on both sides with soft appressed hairs, paler beneath, rounded or obtuse and apiculate at the apex, rounded at the base; spikes axillary or in large terminal panicles, dense, many-flowered, 5-7 cm. long, 8 mm. thick, the flowers apparently pink; calyx and corolla densely pubescent; flowers 5-parted, the stamens 10; legume linear-oblong, 3-5 cm. long, velutinous-pilose, the margin aculeate or unarmed.

There is no proof that this species, in spite of its name, ever has been collected in Guatemala. The type came from Nicaragua, and the specific name must have been the result of a slip of the pen. Britton and Rose, for no obvious reason, cite the type locality incorrectly as Tepic.

Mimosa hemiendyta Rose & Robinson ex Rose, Contr. U. S. Nat. Herb. 8: 32. 1903. *Pteromimosa hemiendyta* Britton, N. Amer. Fl. 23: 172. 1928.

Swamp forest, 200 meters or less; Petén. British Honduras and Yucatan Peninsula of Mexico.

A large shrub or a tree, reported to attain a height of 20 meters but usually lower, the trunk 60 cm. or less in diameter, the branches sparsely recurved-aculeate, the young branches and inflorescence densely ferruginous-tomentose; leaves small, the pinnae 2-4 pairs; leaflets 4-8 pairs, broadly oblong or almost oval, 6-7 mm. long, broadly rounded at the apex, tomentulose when young but in age glabrous or nearly so, paler beneath; peduncles axillary or in terminal racemes, about 1 cm. long, the flowers in dense globose heads, pink; corolla glabrous, 4-5-lobate; stamens 8 or 10; legume oblong, 4-7.5 cm. long, 12-15 mm. wide, brown-tomentulose, thin, acute or acuminate, rather long-stipitate, each margin with a broad, thin, serrate and often cleft wing.

Known in British Honduras as "logwood brush," "bastard logwood," and "catseem logwood"; "zaccatzim" (Yucatan, Maya); also called "boxcatzim" in Yucatan. The species is easy of recognition by its winged fruit, quite unlike that of any other Central American *Mimosa*. A similar species is found in Cuba.

Mimosa hondurana Britton, N. Amer. Fl. 23: 169. 1928. *M. pseudopaniculata* Britton, loc. cit.

Moist forest or thickets 1,300 meters or less; Petén; Santa Rosa; Guatemala; Sacatepéquez. Chiapas; British Honduras; Honduras.

A large woody vine, sometimes 9 meters long or more, the branches, petioles, and leaf rachis armed with numerous small recurved prickles, puberulent; glands

of the petiole minute or wanting; stipules filiform, 5-6 mm. long; pinnae 2-4 pairs, the leaflets 5-9 pairs, rhombic or very obliquely ovate or ovate-lanceolate, 1-3 cm. long, obliquely acute and mucronate, very oblique at the base, subsessile, puberulent or almost glabrous above, softly pubescent or appressed-pilose beneath; flowers white, fragrant, globose-capitate, the heads disposed in large lax panicles, the peduncles filiform, solitary or fasciculate, 5-13 mm. long; calyx and corolla glabrous; stamens twice as many as the corolla lobes; legume 8 cm. long or shorter, 1 cm. wide, dark red, lustrous, glabrous, rounded and short-rostrate at the apex, recurved-aculeate on the margins, the seeds about 8 or fewer.

This has been reported from Guatemala as *M. costaricensis* Benth., a distinct species not found in northern Central America. Called "rabo de iguana" in Honduras.

***Mimosa invisa* Mart. Flora 20, Beibl. 2: 121. 1837.**

Moist or dry thickets or in open places, sometimes in oak forest, 1,650 meters or less; Alta Verapaz; Izabal; Jalapa; Jutiapa; Santa Rosa; Guatemala; Retalhuleu. Southern Mexico; Honduras to Panama; West Indies; tropical South America.

Plants scandent or procumbent, branched, the stems often 2 meters long, angulate, densely armed with short sharp recurved prickles, usually rather densely short-pilose; leaves small, the petiole and rachis densely aculeate, the pinnae 4-8 pairs; leaflets many pairs, oblong-linear, 3-5 mm. long, 1 mm. wide, glabrous, ciliate, paler beneath; peduncles axillary and in terminal racemes, about 1 cm. long, the flowers deep rose-pink, in dense globose heads; calyx and corolla glabrous; stamens 8, purplish; legume linear-oblong, 1-2.5 cm. long, 5-6 mm. wide, short-pilose, abundantly aculeolate on the sides and margins, sessile, 3-5-articulate.

Called "rabo de iguana" in Honduras; "zarza," "zarza zonza" (Salvador). The plant sometimes invades cultivated ground, especially banana plantations, and is a most pernicious and offensive weed. The prickles are so sharp and abundant that it is impossible to touch the plant without receiving lacerations.

***Mimosa Maxonii* Standl. Contr. U. S. Nat. Herb. 17: 432. 1914.**

Moist or dry thickets, 300-1,200 meters; endemic; Escuintla; Sacatepéquez; Suchitepéquez (type collected near Mazatenango, *W. R. Mazon & Robert Hay* 3497); Retalhuleu; San Marcos.

A small woody vine, clambering over shrubs or prostrate on the ground, the stems glabrous, densely armed with rather long and slender, recurved prickles; leaves long-petiolate, the petiole densely aculeate, the pinnae 1 pair; leaflets 2 pairs, elliptic-lanceolate or oblong-lanceolate, very inequilateral, mostly 3-4 cm. long, acute or acuminate, rounded or obtuse and very asymmetric at the base, glabrous above, glabrous beneath or very sparsely setose-strigose; peduncles axillary, 1-2.5 cm. long, solitary or fasciculate, the flowers glabrous, in dense globose heads 5-6 mm. in diameter; corolla 2 mm. long; stamens 10; legume oblong

or narrowly oblong, 2 2.5 cm. long, 6-8 mm. wide, obtuse or abruptly acute, subsessile, 2 4-seeded, setose-aculeate on the margins, the valves densely short-pilose.

This is probably no more than a variety or local race of *M. Veloziana*, which occurs in the same general region.

Mimosa pigra L. Cent. Pl. 1: 13. 1755. *M. asperata* L. Syst. Nat. ed. 10. 1312. 1759. *Sinverguenza*; *Zarza*.

Brushy marshes or wet fields, often in low sandy areas along streams, frequent in upland fields or pastures, often in second growth, 1,300 meters or less; Petén; Izabal; Zacapa; El Progreso; Chiquimula; Jutiapa; Santa Rosa; Guatemala; Suchitepéquez; Retalhuleu; San Marcos. Mexico; British Honduras to Salvador and Panama; West Indies; South America; Old World tropics.

A stout stiff erect shrub, commonly 1-2 meters high, the branches setose with appressed or spreading setae, also sparsely or densely pubescent or tomentose, armed with numerous stout, broad-based, more or less recurved prickles; leaves rather large, the petiole and rachis armed with numerous long prickles, the pinnae 7 15 pairs; leaflets many pairs, linear, 5-8 mm. long, pubescent on both surfaces, setulose-ciliate; peduncles axillary, 2-5 cm. long, the flowers pink, in dense, globose or oval heads; calyx 2 mm. long, the corolla 4-lobate, minutely setulose or hispidulous; stamens 8; legume narrowly oblong, 3-8 cm. long, 10-12 mm. wide, densely setose-hispid with brownish hairs, 10-13-articulate, sessile or short-stipitate.

Called "sensitive weed" in British Honduras; "carbón" (Honduras). This is a characteristic shrub of lowland marshes and, in such situations, can be found almost anywhere in Central America. The leaves are almost as sensitive as those of *M. pudica*, the pinnae drooping immediately after being touched.

Mimosa pinetorum Standl. Field Mus. Bot. 11: 131. 1932.

British Honduras; known only from the type, *H. H. Bartlett* 11629, in ravine, Mountain Pine Ridge, El Cayo District.

A procumbent herb 1.5 meters long, the slender stems quadrangular, armed with a few slender recurved prickles 1 mm. long, glabrous; leaves slender-petiolate, the petioles aculeolate, the pinnae 1 pair; leaflets about 8 pairs, oblong, 10 mm. long, 3 mm. wide, rounded at the apex, glabrous; stipules filiform, 2.5 mm. long; peduncles axillary, solitary, slender, glabrous, 1.5-2.5 cm. long; legume linear, 3-4.5 cm. long, 4-5 mm. wide, short-stipitate, cuspidate, glabrous, the margins densely setulose-aculeate, the articulations 7-11.

Mimosa platycarpa Benth. Trans. Linn. Soc. 30: 417. 1875. *Neomimosa platycarpa* Britt. & Rose, N. Amer. Fl. 23: 173. 1928. *Espinita*.

Dry, brushy, often rocky plains and hillsides, 200-1,200 meters; type collected in Guatemala by Skinner, the locality not indicated; endemic; Zacapa; Chiquimula; Guatemala (Fiscal).

A shrub or small tree, sometimes 6 meters high, the branches armed with small or rather large, very stout, broad-based, spreading or somewhat recurved prickles, the branchlets almost glabrous; stipules small, setaceous; leaves small, the pinnae 6-10 pairs; leaflets mostly 9-20 pairs, linear-oblong, 3-5 mm. long, obtuse, when young sparsely and minutely pilose beneath or almost wholly glabrous, often ciliate; flowers white or pink, spicate, the spikes slender, about 2.5 cm. long, lax, the flowers 5-parted; stamens 10; legume slender-stipitate, compressed and thin, 3-6.5 cm. long, 1.5-2.5 cm. wide, acute to rounded at the apex, acute or obtuse at the base, glabrous, the valves continuous, the margins sparsely or densely armed with short or long, straight, spreading prickles, or sometimes unarmed.

The shrub is a common and characteristic one of the dry Zacapa region. It exhibits much variation in the size and prickliness of the fruits.

Mimosa pudica L. Sp. Pl. 518. 1753. *Sensitiva*; *Cac-kix* (Quechí); *Putá vieja*; *Cierra tus puertas*; *Dormilona*. *Sensitive plant*.

Common in moist or wet thickets or open places, often in savannas, abundant in the lowlands in waste ground and about dwellings, often plentiful along paths, 1,550 meters or less, and mostly below 1,000 meters; Petén; Alta Verapaz; Izabal; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Sacatepéquez; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos. Southern Mexico; British Honduras to Salvador and Panama; West Indies; South America; naturalized in the Old World tropics.

Plants essentially annual, erect or spreading, rarely suffrutescent, the stems long-pilose or glabrate, seldom more than 60 cm. long, sparsely or densely armed with stout, spreading or recurved prickles; stipules lanceolate, striate, 3-6 mm. long; leaves long-petiolate, small, the pinnae 1-2 pairs, inserted at or near the end of the rachis; leaflets 15-25 pairs, oblong or linear-oblong, 5-10 mm. long, very obtuse to acute and mucronate at the apex, obliquely rounded at the base, glabrate, often setulose-ciliate; peduncles 1-2 cm. long, axillary, the flowers pink; calyx minute; petals 4; stamens 4; legume linear-oblong, 1-1.5 cm. long, 3 mm. wide, 2-5-articulate, glabrous or nearly so, the margins densely armed with long spreading setae.

Sometimes called "zarza" and "zarza dormilona" in Salvador; "xmuts," "xmumuts" (Yucatan, Maya). In Guatemala the plant is abundant throughout the lowlands, but it is absent or rare in the mountain regions. In Guatemala City it sometimes is planted as a curiosity, just as it is grown in hothouses of North America and Europe. This is the best known of the sensitive plants, its leaflets folding together and the leaves drooping immediately when they are

disturbed. Looking back after crossing a pasture where the plant abounds, one can easily trace one's steps by the different appearance of the *Mimosa* plants that have been touched in passing; but after a few minutes the leaves resume their normal position. The plants behave also in much the same manner upon the approach of darkness, or when disturbed by rain. Many other species of *Mimosa* and many plants of other genera of the Mimoseae of course act in the same manner. Wisdom states that in the Jocotán region sleep is induced in infants by bathing them in a decoction of this or some related species, a most curious attempt to utilize an obvious property of the plant, but probably not a very efficacious remedy.

***Mimosa Recordii* Britt. & Rose, N. Amer. Fl. 23: 170. 1928.**
M. Rekoana Britton, loc. cit. (type from Oaxaca). *Zarza*.

Moist or wet thickets or forest, often in second growth, 1,500 meters or less; Sacatepéquez; Chimaltenango; Quezaltenango; San Marcos. Southern Mexico; British Honduras (type from Middlesex, Stann Creek District, *S. J. Record*).

A small or large, woody vine, sometimes climbing over medium-sized trees, the branches angulate or in age subterete, densely pubescent, densely armed with small recurved prickles, like the petioles and leaf rachises; petiole and rachis bearing large sessile cupular glands, the pinnae 4-6 pairs; leaflets 4-9 pairs, broadly oblong to rhombic or rounded, mostly 1-2 cm. long, rounded or obtuse at the apex, very asymmetric at the base, densely pilose with short, spreading or subappressed hairs, paler beneath; flowers white, fragrant, in small globose heads, these on peduncles 4-8 mm. long, very numerous and forming large open panicles, the branches densely short-pilose; flowers glabrous, the calyx subtruncate; corolla 4 5-lobate; stamens 8 or 10; legume 6-10 cm. long, about 1.5 cm. wide, with 10 or fewer articulations, glabrous or nearly so in age, the margins armed with a few minute prickles or unarmed.

Called "haulback" in British Honduras.

***Mimosa resinifera* Britton, N. Amer. Fl. 23: 169. 1928.**

Wet thickets or forest, at or near sea level; Izabal. Atlantic lowlands of Honduras, the type from Tela.

A large woody vine, the branches angulate at first, subterete in age, hirtellous or subtomentose, densely armed with short recurved prickles; petiole and rachis densely aculeate, bearing elevated short-cylindric glands, the pinnae 2-3 pairs; leaflets 2-3 pairs, large, rhombic-ovate to broadly obovate, mostly 3-7 cm. long, obtuse, very oblique at the base, rather thin, sparsely short-pilose or puberulent on the veins, sparsely resin-dotted beneath; flowers white, in globose heads, the peduncles 5-10 mm. long, disposed in large terminal panicles; flowers 4-parted, the calyx minute; corolla 1.5 mm. long; stamens 8; legume unknown.

Mimosa scalpens Standl. Carnegie Inst. Wash. Publ. 461: 58. 1935.

Wet thickets or forest, 370 meters or less; Alta Verapaz; Izabal. British Honduras, the type from Jacinto Hills, *W. A. Schipp* S497.

A small or large, woody vine, sometimes 12 meters long, the branches subterete, striate-angulate, densely short-pilose, densely covered with small recurved prickles; leaves rather large, the petiole and rachis aculeolate, the pinnae 3-10 pairs; leaflets about 15 pairs, oblong, 7-11 mm. long, 2.5-5 mm. wide, apiculate-acuminate, obliquely rounded at the base, pilosulous above with appressed or spreading hairs, paler beneath and densely appressed-pilose; flowers white, capitate, the peduncles axillary and solitary or forming small panicles; calyx 1.5 mm. long, glabrous except on the lobes; corolla 5-parted, 3 mm. long, glabrous; stamens 10; legume linear-oblong, about 6 cm. long and 1.5 cm. wide, rounded and mucronate at the apex, strongly compressed, short-stipitate, glabrous, lustrous, about 8-articulate, the margins recurved-aculeate or sometimes unarmed.

Mimosa sesquiugata Donn. Smith, Bot. Gaz. 13: 74. 1888.

Moist thickets or in clefts of exposed cliffs, 200-1,500 meters; endemic; Baja Verapaz (type from Santa Rosa, *Tuerckheim* 1327); Zacapa.

An erect shrub 2 meters high or less, the branches glabrous or nearly so, unarmed or with sparse small recurved prickles; stipules linear, striate, 3 mm. long; leaves slender-petiolate, the pinnae 1 pair; leaflets 2 pairs, the lower ones much reduced, the upper ones very inequilateral, oblong-ovate, 1.5-3.5 cm. long, obtuse or subacute, semicordate at the base, glabrous and green above, pale beneath and densely appressed-setulose, setulose-ciliate; flowers 4-parted, pinkish white, in dense globose heads, the peduncles slender, often equaling the petioles; calyx minute; corolla glabrous, 2 mm. long; stamens 4; legume unknown.

Mimosa Skinneri Benth. Lond. Journ. Bot. 5: 85. 1846 (type from "Cuesta de León," Baja Verapaz(?), Guatemala, *Skinner*). *M. tetraura* Brandeg. Univ. Calif. Publ. Bot. 6: 52. 1914. *Guachimos*; *Dormilona*.

Dry, rocky thickets or open plains or hillsides, sometimes in open pine forest, frequently in open fields or in dried mud, 1,700 meters or less; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala. Chiapas; Salvador; Costa Rica.

Plants annual, usually much branched from the base, erect or prostrate, the stems hirsute or hispid, mostly 50 cm. long or less, armed with pale straight infrastipular prickles; stipules lanceolate, long-ciliate; leaves small, the pinnae 1-2 pairs, approximate; leaflets 4-8 pairs, obovate or oval, mostly 7-9 mm. long, rounded at the apex, glabrous above, setose-hispid beneath with few or numerous long hairs; peduncles axillary, equaling or longer than the petioles, hispid, the flowers capitate, purplish rose, 4-5-parted; stamens 4-5; legume oblong, 1.5-2 cm.

long, 4 mm. wide, about 4-articulate, the valves glabrous or short-pilose and sometimes setose, the margins densely setose.

Sometimes called "charqueta" and "zarza" in Salvador.

Mimosa somnians Humb. & Bonpl. ex Willd. Sp. Pl. 4: 1036. 1806. *Dormilona*.

Chiefly on brushy, rocky hillsides or in pine-oak forest, sometimes in sand along stream beds, 1,400 meters or less; Petén; Alta Verapaz; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; San Marcos. Southern Mexico; British Honduras; Salvador; Costa Rica; Panama; southward to Paraguay.

Plants erect and frutescent, 1.5 meters high or less, or often almost wholly herbaceous, sometimes procumbent, usually densely glandular-pilose but occasionally almost glabrous, usually armed with numerous spreading prickles; petioles and leaf rachis aculeate or unarmed, the pinnae 2-8 pairs; leaflets 12-18 pairs, linear-oblong, 2-4 mm. long, rounded at the apex, glabrous or nearly so, with prominent venation; flowers pink, 4-parted, in dense globose heads, the peduncles mostly axillary; corolla conspicuously striate, glabrous; stamens 8; legume linear, 4-7 cm. long, 2-4 mm. wide, glandular-pilose or glabrous, long-stipitate, acute, often conspicuously constricted between the seeds, with numerous articulations, the margins glandular-setulose or naked.

Ordinarily the species is easily recognized by the dense gland-tipped hairs, but in some forms the stems and foliage are almost wholly glabrous.

Mimosa teledactyla Donn. Smith, Bot. Gaz. 56: 57. 1913.

Dry, rocky plains and hillsides, 300-1,000 meters; endemic; Baja Verapaz (type from Santa Rosa, *O. F. Cook* 234); Zacapa; Chiquimula.

Plants annual, the stems 1 meter long or shorter, setulose and aculeate; petiole and rachis aculeolate or unarmed, the pinnae 2-3 pairs; leaflets 8-10 pairs, oblong, rounded at each end, 8-12 mm. long or shorter, glabrous or pubescent, the margins often setulose-ciliate; peduncles axillary, slender, 5 cm. long or shorter, setulose, the flowers 4-parted, in globose heads; calyx minute, the corolla 3 mm. long, pink; stamens 4; legume oblong, about 2-seeded, 8 mm. long, 3-4 mm. wide, short, pilose and abundantly setose.

Mimosa Velloziana Mart. Herb. Fl. Bras. 185. 1837.

Dry or moist thickets, often along rocky stream banks, 1,500 meters or less, mostly at 500 meters or lower; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu; San Marcos. Southern Mexico; Costa Rica; Panama; southward to Paraguay.

A small or large, woody vine, the stems angulate or subterete, scandent or sprawling over the ground, green, glabrous, densely armed with short recurved

prickles; stipules lanceolate; leaves long-petiolate, the petioles aculeate, the pinnae 1 pair; leaflets 2 pairs, ovate-oblong or oblong-lanceolate, mostly 3-4 cm. long, the lowest ones much reduced, the upper ones acute, glabrous and bright green above, appressed-setose beneath and on the margins or glabrate; peduncles short, the flowers pink, 4-parted, in globose heads; stamens 4; legume oblong, 1.5-2.5 cm. long, 8 mm. wide, rounded and mucronate at the apex, glabrous, bearing on the margins and often also on the valves numerous long spreading stramineous straight prickles.

Wherever it grows, this shrub is a great pest because of its offensive covering of sharp curved prickles that cause the branches and leaves to cling tenaciously to clothing and rip and tear the flesh.

Mimosa Watsonii Robinson, Proc. Amer. Acad. 36: 473. 1901 (type *Sereno Watson* 323 and 185, probably from Izabal).

Wet forest or thickets, at or little above sea level; endemic; Izabal.

A small or large, woody vine, the branches terete or at first angulate, densely short-pilose or subtomentose, abundantly armed with very small, recurved prickles; petiole and leaf rachis tomentulose and aculeate, bearing one or more large cupular glands, the pinnae 1-3 pairs; leaflets 1-3 pairs, broadly obovate to rounded-rhombic or rhombic-ovate, mostly 2-5 cm. long, obtuse or rounded at the apex, very oblique at the base, strigillose above, densely and softly short-pilose beneath; flowers 4-parted, glabrous, in small globose heads, these very numerous, forming large terminal panicles, the peduncles 5-10 mm. long; stamens 8; legume 5-7 cm. long, about 1 cm. wide, obtuse or rounded at the apex, strongly compressed, in age glabrous or nearly so, about 10-articulate.

Mimosa zacapana Standl. & Steyerl. Field Mus. Bot. 23: 57. 1944. *Espinito*; *Motaspina*.

Dry, rocky hillsides or plains, 200-900 meters; endemic; Zacapa (type collected near Santa Rosalía, *Steyermark* 29018); Chiquimula; Huehuetenango.

A shrub 1-1.5 meters high or sometimes a small, densely branched tree, the branches sparsely hirtellous or glabrate, armed with few short, spreading, rather stout prickles; stipules subulate; leaves short-petiolate, the petioles mostly 1-1.5 cm. long, the pinnae 1 pair; leaflets 6-9 pairs, oblong, 6-11 mm. long, 2.5-3.5 mm. wide, obtuse or subacute, subapiculate, thick, appressed-setulose-ciliate, glabrous above, sparsely short-setulose beneath and often sparsely pilosulous or almost wholly glabrous, costa somewhat excentric; peduncles axillary, solitary, 3-4.5 cm. long, very slender, glabrous or nearly so, the flowers in globose heads, pink, with white filaments, glabrous or the corolla sparsely puberulent on the lobes, 2.5 mm. long; stamens as many as the corolla lobes; legume about 3 cm. long, 7 mm. wide, slightly constricted between the seeds, pubescent, bearing a few minute inconspicuous setae on the margins and sometimes on the valves, about 4-articulate.

NEPTUNIA Loureiro

Perennial herbs or suffrutescent plants, sometimes aquatic; leaves bipinnate, the leaflets numerous, small; stipules membranaceous, obliquely cordate; flowers 5-parted, in ovoid-globose heads, the upper flowers perfect, the lower often staminate or neutral, the peduncles axillary, solitary; calyx campanulate, shallowly dentate; petals coherent to the middle or free, valvate; stamens 10 or rarely 5, free, exerted; anthers tipped with a stipitate gland; ovary stipitate, with numerous ovules, the style filiform, the stigma terminal, small, concave; legume oblique-oblong, often deflexed from the stipe, compressed and flat, membranaceous-coriaceous, 2-valvate, subseptate within between the seeds; seeds transverse, ovate, compressed.

About 10 species, chiefly in tropical regions of America, Asia, and Australia. One other species has been reported from Panama.

Plants terrestrial, the stems slender, not inflated or spongy; petiole with a gland near the apex. *N. plena*.

Plants aquatic, floating, the stems thick and inflated, spongy; petiole eglandular. *N. prostrata*.

Neptunia plena (L.) Benth. in Hook. Journ. Bot. 4: 355. 1841.
Mimosa plena L. Sp. Pl. 519. 1753.

Brushy, grassy, dry or moist plains or hillsides, often in weedy fields, sometimes on sand flats or salt flats, 800 meters or less; Zacapa; Jutiapa; Retalhuleu; San Marcos. Western and southern Mexico; Panama; West Indies; tropical South America.

Plants glabrous, usually much branched and prostrate, the stems a meter long or usually much shorter; stipules ovate or lanceolate, 4–6 mm. long; leaves petiolate, the pinnae 2–4 pairs; leaflets usually 12–20 pairs, linear-oblong, 4–10 mm. long, obtuse; peduncles mostly 6–14 cm. long, bearing 1–2 cordate bracts at or below the middle; heads ovoid, the flowers yellow, the upper ones perfect, the lower ones with long-exserted staminodia; legume 2–5 cm. long, 8 mm. wide, rounded and apiculate at the apex, long-stipitate, the margins narrowly thickened.

Neptunia prostrata (Lam.) Baill. Bull. Soc. Linn. Paris 1: 356. 1883. *Mimosa prostrata* Lam. Encycl. 1: 10. 1783. *N. oleracea* Lour. Fl. Coch. 654. 1790. *Lechuga*.

Floating in lakes or ponds, 450–1,000 meters; Chiquimula (La Laguna, near Chiquimula); Jutiapa (Lago de Güija). Southern Mexico; Cuba; Jamaica; tropical South America, Asia, and Africa.

Plants floating in quiet water, usually simple, glabrous throughout, the stems very thick and spongy, zigzag, bearing large tufts of fibrous roots, also with hollow swellings 1–2 cm. in diameter; stipules triangular-ovate, 5–7 mm. long; petioles 4–6 cm. long, eglandular, the pinnae 2–3 pairs; leaflets 8–20 pairs, oblong or linear-oblong, 6–13 mm. long, obtuse or rounded at the apex; peduncles axillary, solitary, in fruit 12–30 cm. long, bearing 1–2 ovate or lanceolate bracts; heads subglobose,

many-flowered; perfect flowers white, the basal neuter flowers yellow, the calyx 2 mm. long; corolla 4 mm. long; legume 2-2.5 cm. long, 8-10 mm. wide, rounded and mucronate at the apex, deflexed at a right angle from the stipe; seeds 5-8.

This is a remarkable member of the Leguminosae, for there are few plants of the vast family that are true aquatics.

PIPTADENIA Bentham

Shrubs or trees, aculeate or unarmed; leaves bipinnate, the leaflets small, numerous, the petiole and rachis usually glandular; flowers small, 5-parted, white, yellowish, or greenish, spicate or in globose heads, the peduncles axillary, solitary or fasciculate, sometimes forming terminal panicles; calyx campanulate, shallowly dentate; petals usually connate to the middle, valvate; stamens 10, free, exserted, the anthers tipped with a deciduous gland; ovary subsessile, 3-many-ovulate; legume stipitate or sessile, broadly linear, compressed, membranaceous or coriaceous, 2-valvate, the valves straight or constricted between the seeds; seeds compressed, the funicle filiform.

About 60 species, in the tropics of both hemispheres. Only the following are known in Central America.

Leaflets linear, 1 mm. wide; fruit not constricted between the seeds. . . . *P. flava*.
 Leaflets oval or rhombic, 3-10 mm. wide; fruit conspicuously constricted between the seeds. . . . *P. constricta*.

Piptadenia constricta (Micheli & Rose) Macbride, Contr. Gray Herb. 59: 18. 1919. *Goldmania constricta* Micheli & Rose ex Micheli, Mém. Soc. Phys. Hist. Nat. Genève 34: 274. pl. 20. 1903. *Pityrocarpa constricta* Britt. & Rose, N. Amer. Fl. 23: 190. 1928.

Dry thickets on plains, 120 meters or less; Retalhuleu (between Nueva Linda and Champerico, Standley 87647); probably in all the Pacific coast departments. Pacific coast of Mexico; Salvador.

A tree of 10-12 meters, unarmed or with a few short spines, the branchlets densely pubescent at first; stipules small, subulate; petiole bearing a large orbicular gland near the middle; pinnae 3-5 pairs, the leaflets 5-9 pairs, rhombic to obovate, 6-17 mm. long, rounded at the apex, very oblique at the base, puberulent or glabrate, paler beneath; spikes short-pedunculate, solitary or geminate, slender, 5-8 cm. long; corolla yellowish green, 2 mm. long, glabrous; legume 10-15 cm. long, 6-8 mm. wide, very deeply constricted between the numerous seeds; seeds oblong, 5 mm. long.

Known in Salvador as "lengua de vaca" and "quebracho."

Piptadenia flava (Spreng.) Benth. Trans. Linn. Soc. 30: 371. 1875. *Acacia flava* Spreng. ex DC. Prodr. 2: 469. 1825.

Rather dry, open hillsides, 300–875 meters; Zacapa; Chiquimula. Southern Mexico; Panama; northern South America, southward to Ecuador.

A shrub or small tree, 3–5 meters high, the branches usually with small recurved prickles, puberulent when young; leaf rachis pubescent or glabrate, sparsely aculeolate or unarmed, the pinnae 8–13 pairs; leaflets 12–25 pairs, linear, 5–10 mm. long, acute or subacute, glabrous; flower spikes axillary and forming terminal panicles, 4–8 cm. long; flowers yellow, the corolla glabrous; legume oblong-linear, 5–9 cm. long, 10–18 mm. wide, rounded and apiculate at the apex, acute to rounded at the base, thin, glabrous, gland-dotted when young, the valves thin, not constricted between the seeds.

PITHECOLOBIUM Martius

Shrubs or trees, unarmed or with spinescent stipules or axillary spines; leaves bipinnate, the leaflets small and numerous or large and few; petioles and leaf rachis usually glandular; stipules usually small and inconspicuous, sometimes spinescent; flowers 5-parted, in globose heads or elongate spikes, mostly white or pink, the peduncles solitary or fasciculate, supra-axillary, axillary, or terminal, sometimes racemose; calyx campanulate or tubular, shallowly dentate; corolla tubular or funnelform, the petals connate to the middle or higher, valvate; stamens numerous, long-exserted, connate at the base or often much higher to form a tube, the anthers small; ovary sessile or stipitate, usually many-ovulate, the style filiform, the stigma terminal, small or capitate; legume exceedingly variable in form, compressed or flat, straight or falcate or often much contorted, sometimes terete, coriaceous or subcarnose, 2-valvate or indehiscent; seeds often imbedded in pulp, ovate or orbicular, commonly compressed, the funicle filiform or often expanded as an aril.

Probably almost or fully 200 species, in the tropics of both hemispheres. Several other species are known from Central America. The generic name appeared originally as *Pithecellobium*, and has been written also *Pithecollobium*, but we prefer the form used here, which has been adopted by practically all authors. The species listed here were scattered by Britton and Rose (in *North American Flora*) among seven genera. Some of these genera were based upon fruit characters and have some basis for separation. Others were based on shape and number of leaflets, which would scarcely be considered generic characters by even not very conservative botanists. What purpose is served by such splitting of the genus, other than increasing the number of generic names to be remembered and cluttering an overloaded synonymy with many new nomenclatural changes and combinations, is not obvious.

Leaflets 1–2 pairs, rarely 4–5 pairs but the pinnae then only 1 pair; leaflets usually large, often 2 cm. wide or more; branches often armed with spines.

Flowers in dense elongate spikes, these in the leaf axils or in terminal panicles, not arising from naked nodes; fruit narrow, usually contorted, somewhat fleshy.

- Leaflets conspicuously pubescent beneath.
- Corolla about 3 mm. long; stamen tube not exerted *P. sarosum*.
- Corolla 5-7 mm. long; stamen tube conspicuously exerted.
- Calyx less than 1 mm. long; leaflets velutinous-pubescent, rounded at the apex, the veins not conspicuous beneath. *P. Brownii*.
- Calyx 3 mm. long; leaflets sparsely hirsute beneath, acute or pointed at the apex, the veins elevated and very conspicuous beneath. *P. Johanseni*.
- Leaflets glabrous or essentially so.
- Calyx about 1 mm. long. *P. microstachyum*.
- Calyx 2-4 mm. long.
- Legume terete, about 2 cm. thick. *P. pachypus*.
- Legume somewhat compressed or subterete, about 1 cm. thick.
- Bractlets lanceolate or subulate, rather conspicuous. *P. insigne*.
- Bractlets deltoid, minute. *P. lanceolatum*.
- Flowers capitate or in short spikes, if spicate the spikes arising from naked nodes on old wood; fruit often flat and not contorted, but sometimes contorted and fleshy.
- Leaflets only 2 in each pinna.
- Calyx and corolla puberulent; branches aculeate; leaflets chartaceous. *P. dulce*.
- Calyx and corolla glabrous; branches unarmed; leaflets coriaceous. *P. keyense*.
- Leaflets 3 or more in each pinna.
- Branches aculeate; leaflets 1-2.5 cm. long. *P. platylobum*.
- Branches unarmed; leaflets larger.
- Flowers in short spikes, these often head-like.
- Legume glabrous; leaflets mostly 6-9 cm. wide, acute or obtuse; corolla 5 mm. long. *P. belizense*.
- Legume densely ferruginous-tomentulose, at least when young; leaflets 2.5-5 cm. wide; corolla 9-10 mm. long. *P. Stevensonii*.
- Flowers in globose or short-oblong heads.
- Inflorescences axillary; legume subterete, strongly constricted between the seeds. *P. Standleyi*.
- Inflorescences arising from leafless branches; legume compressed, not constricted between the seeds. *P. Recordii*.
- Leaflets numerous pairs, if few the pinnae more than 1 pair; leaflets often small and linear or oblong; branches usually unarmed.
- Flowers conspicuously pedicellate, umbellate.
- Leaflets densely and softly pubescent. *P. Saman*.
- Leaflets glabrous or nearly so.
- Leaflets 2-7 mm. wide.
- Pedicels much longer than the calyx; leaflets 2-3 mm. wide. *P. halogenes*.
- Pedicels equaling or shorter than the calyx; leaflets 5-7 mm. wide. *P. Zollerianum*.
- Leaflets all or mostly 10-25 mm. wide. *P. leucocalyx*.
- Flowers sessile, capitate or spicate.
- Flowers spicate.
- Pinnae 10-15 pairs. *P. macrandrium*.
- Pinnae 2-4 pairs.

- Leaflets oval or oblong, rounded at the apex. *P. Peckii*.
 Leaflets oblong-lanceolate, tapering to the apex. *P. pistaciifolium*.
 Flowers capitate.
 Branches armed with spines.
 Legume about 2 cm. wide, ferruginous-tomentulose; leaflets little more than 1 mm. wide, with inconspicuous venation. *P. albicans*.
 Legume about 1 cm. wide, glabrous; leaflets 2.5–3 mm. wide, with conspicuous elevated venation. *P. leucospermum*.
 Branches unarmed.
 Leaflets linear or oblong-linear, mostly 7–15 mm. long and 2–3 mm. wide.
 Peduncle bearing a large curved dark gland near the apex; leaflets falcate-linear. *P. Tuerckheimii*.
 Peduncle eglandular or the glands minute.
 Leaflets oblong or linear-oblong, usually 15 or fewer pairs. *P. vulcanorum*.
 Leaflets linear or nearly so, mostly 20–40 pairs. *P. arboreum*.
 Leaflets mostly oblong or broader, 1.5–5 cm. long and 4–12 mm. wide or even larger.
 Leaflets broadly oblong to obovate, obtuse or even rounded at the apex.
 Peduncle bearing a conspicuous bract; leaflets usually copiously pubescent beneath, sometimes glabrate in age. *P. erythrocarpum*.
 Peduncle not bracteate; leaflets glabrous or nearly so. *P. graciliflorum*.
 Leaflets mostly lance-oblong, acute or acutish.
 Leaflets conspicuously palmate-veined at the base, the several lowest veins ascending at a narrow angle far above the base of the blade. *P. Tonduzii*.
 Leaflets penniveined, the veins all except sometimes one spreading from the costa.
 Bractlets linear, longer than the calyx, persistent. *P. Donnell-Smithii*.
 Bractlets small, usually much shorter than the calyx, often deciduous. *P. tenellum*.

Pithecolobium albicans (Kunth) Benth. Trans. Linn. Soc. 30: 592. 1875. *Acacia albicans* Kunth, Mimos. 87. pl. 27. 1821. *Havardia albicans* Britt. & Rose, N. Amer. Fl. 23: 41. 1928.

British Honduras (Corozal District, *P. H. Gentle* 535); to be expected in Petén. Yucatan Peninsula of Mexico.

A tree, the trunk as much as 18 cm. in diameter; stipular spines short and stout, sometimes absent; branchlets puberulent at first; petiole puberulent, bearing a large sessile gland; pinnae 6–9 pairs, the leaflets 18–32 pairs, oblong, 3–10 mm. long, glabrous above, paler and puberulent beneath, the costa somewhat excentric; peduncles axillary or paniculate, puberulent; calyx 1.5 mm. long, puberulent; corolla 3 mm. long, the stamens 7 mm. long, with a short tube; legume linear-oblong, 10–12 cm. long, 2–2.5 cm. wide, rounded or acute at the apex and rostrate,

acute at the base, short-stipitate, densely ferruginous-tomentulose, flat, the valves thin, their margins thickened.

Maya names of Yucatan are "chucum" and "chimay"; "huisache" (Campeche). In the Yucatan region the bark is used for tanning hides, and an infusion of it is a domestic remedy for diarrhea. The tree produces a gum similar to that of mesquite (*Prosopis*). The pods are reported to contain 18 per cent of tannin and to afford a black dye.

Pithecolobium arboreum (L.) Urban, Symb. Antill. 2: 259. 1900. *Mimosa arborea* L. Sp. Pl. 519. 1753. *Cojoba arborea* Britt. & Rose, N. Amer. Fl. 23: 29. 1928. *Plumillo* (Quezaltenango); *Quebracho*, *Cola de mico*, *Cola de marrano* (names reported from Izabal).

Moist or wet forest, sometimes on limestone, 1,500 meters or less; Petén; Alta Verapaz; reported from Izabal, perhaps in error; Huehuetenango; Quezaltenango; San Marcos. Southern Mexico; British Honduras; Honduras; Costa Rica; Greater Antilles.

A small to very large tree, sometimes 35 meters high, the crown broad and spreading, sometimes rounded, the trunk frequently a meter in diameter, sometimes supported by high narrow buttresses; bark dark brown or light greenish brown, scaly or fairly smooth; branchlets, leaf rachis, and peduncles densely pubescent with short spreading brownish hairs; leaves often very large and fern-like, the pinnae 8-16 pairs, with a small brownish gland on the rachis between each pair; leaflets 20-40 pairs, falcate-linear, 8-12 mm. long, acute, palmate-veined at the base, glabrous, pale beneath; peduncles often very slender, mostly 5-10 cm. long; flowers in dense globose heads, white; calyx 2 mm. long, glabrous or nearly so; corolla tubular, 6-8 mm. long, glabrous; stamen tube included; legume subterete, somewhat fleshy, bright or dark red, in age coiled or twisted, as much as 18 cm. long, 1 cm. or less in diameter, puberulent or glabrate, tardily dehiscent; seeds large, oval, black.

Called "wild tamarind" in British Honduras; "barba de jolote" (Honduras). The wood has the general appearance of mahogany and sometimes is beautifully figured; it is dark red or reddish brown, sometimes with darker stripes; not highly lustrous; sapwood grayish; without distinctive odor or taste; moderately hard and heavy, the specific gravity 0.74; weight about 46 pounds per cubic foot; grain somewhat roey, the texture medium; not difficult to work, finishes smoothly, is durable. The timber, known in the trade as "Bahama sabicú," is exported principally from the West Indies. It was introduced into England in 1878 for making bobbins used in cotton mills. It is used in Central America for flooring, ceiling, and posts,

and for general construction and carpentry. In the United States it has been employed for cabinetwork and furniture.

Pithecolobium belizense Standl. Field Mus. Bot. 4: 212. 1929. *Inga Peckii* Robinson, Proc. Amer. Acad. 49: 502. 1913. *Zygia Peckii* Britt. & Rose, N. Amer. Fl. 23: 39. 1928.

Occasional in forest, 1,200 meters or less; Petén; Alta Verapaz; Izabal. British Honduras, the type *M. E. Peck* 673, from some unspecified locality; Tabasco.

An almost glabrous, unarmed tree, 7-9 meters high, the trunk 20-40 cm. in diameter; leaves large, sessile or nearly so, with a large gland between the single pair of pinnae; leaflets 2-3 pairs, lance-oblong or elliptic-oblong, 9-20 cm. long, 6-9 cm. wide, acute or acuminate, oblique and more or less acute at the base, subcoriaceous; inflorescences mostly clustered on old wood at leafless nodes, the inflorescences short-pedunculate, capitate or very shortly spicate, few-flowered, the flowers white, somewhat fragrant; calyx 2 mm. long, glabrous, the corolla glabrous, 5 mm. long; stamen tube exserted; legume 11-18 cm. long, 2-3.5 cm. wide, compressed and flat, somewhat falcate, rounded at each end, sessile or nearly so, glabrous.

One collection reported from Petén as *P. Englesingii* Standl., a Nicaraguan species, is probably referable here.

Pithecolobium Bertolonii Benth. Trans. Linn. Soc. 30: 588. 1875. *Mimosa monilifera* Bertol. Fl. Guat. 441. 1840, not *P. moniliferum* Benth. 1844. *Feuillea Bertolonii* Kuntze, Rev. Gen. 187. 1891.

Type collected in Escuintla by Velásquez.

Branches pubescent; leaves petiolate, the petioles pubescent, the pinnae 2 pairs; glands urceolate, at the apex of the leaf rachis and between the leaflets; leaflets 2 pairs, elliptic, obtuse, pilose; flowers capitate, racemose, the heads pedunculate or subsessile; legume compressed, torulose, constricted between the seeds, falcate, 3-4-seeded, red, velutinous; pubescence white.

This seems to be known only from the type, which apparently no one but Bertoloni has seen. The proper position of the plant is unknown, and it has not been included in the key to species presented here. Benthham considered it probably related to *P. sophorocarpum* Benth., but no Guatemalan species of that alliance has few leaflets. The flora of Escuintla has been thoroughly collected, and one would expect the plant to be found in recent collections. It is quite possible that the plant may be related to *P. dulce*, common in the Escuintla region, although Bertoloni does not mention spines.

Pithecolobium Brownii Standl. Trop. Woods 18: 30. 1929.

British Honduras, at low elevations, along lagoons and rivers; type from Hillbank, C. S. Brown 28.

A tree of 9 meters, the trunk 50 cm. in diameter, the branchlets densely velutinous-hirtellous; spines stout, 2.5 mm. long; leaves petiolate, the pinnae 1 pair, the leaflets 4, sessile, oval-oblong, 3-5 cm. long, 1.5-2.7 cm. wide, rounded or very obtuse at the apex, sometimes emarginate, obliquely rounded at the base, minutely hirtellous above, velutinous-pilosulous beneath; flowers spicate, the spikes axillary, solitary or subpaniculate at the ends of the branches, 1-1.5 cm. long, head-like, on peduncles 2-3 cm. long; bractlets minute, triangular; calyx 0.6 mm. long; corolla 5 mm. long, minutely sericeous; stamen tube exserted; ovary sessile.

The local name is "red fowl." The sapwood is yellow, the heartwood brown, very hard, heavy, tough, and strong, of medium texture, probably durable; not utilized.

Pithecolobium Donnell Smithii (Britt. & Rose) Standl. Field Mus. Bot. 12: 168. 1936. *Cojoba Donnell-Smithii* Britt. & Rose, N. Amer. Fl. 23: 30. 1928 (type from Izabal, Izabal, *J. D. Smith* 1733). *P. Gentilei* Lundell, Contr. Univ. Mich. Herb. 6: 28. 1941 (type collected near Vaca, El Cayo District, British Honduras, *P. H. Gentile* 2452). *P. plumosum* Lundell, op. cit. 30 (type from Mountain Pine Ridge, El Cayo District, British Honduras, *H. H. Bartlett* 11627). *P. Schippii* Lundell, op. cit. 31 (type from Temash River, Toledo District, British Honduras, *W. A. Schipp* 1318). *Frijol de mico*; *Chalib* (Alta Verapaz).

Moist or wet forest, sometimes in upland pine forest, 350 meters or less; Alta Verapaz; Izabal. British Honduras; Chiapas; Honduras.

An unarmed shrub or tree, sometimes 9 meters high, with a slender trunk, the young branchlets and peduncles densely ferruginous-pubescent; leaves mostly large, the pinnae 2-7 pairs, with a small orbicular gland between each pair; leaflets 8-18 pairs, obliquely lanceolate or lance-oblong, mostly 1-2 cm. long but sometimes slightly larger, acute or subacute, green and glabrous above, paler beneath, puberulent on the costa or almost glabrous; peduncles slender, 6 cm. long or shorter; flowers in globose heads, white and green, the bractlets subulate, longer than the calyx, persistent and often elongate in fruit; calyx minute, the teeth ferruginous-puberulent; corolla slender-tubular, 9 mm. long, glabrous; stamen tube included, the filaments elongate and conspicuous; legume subterete, 10-18 cm. long, 1 cm. in diameter, contorted, deeply constricted between the seeds, bright red, puberulent or tomentulose; seeds usually numerous, black, lustrous.

Called "John Crow bead" in British Honduras. The species has been reported from Guatemala as *P. sophorocarpum* Benth., a Costa Rican plant. The wood is pale brown, of medium density, coarse-textured, not durable. The several segregates from this species are based upon slight differences of doubtful constancy or systematic importance. It may be that further collections will validate their segregation, but it is more probable that ample col-

lections will only accentuate the innumerable variations existing in this group. Most of the 17 species of *Cojoba* recognized by Britton and Rose are based on very "feeble" characters and it is doubtful that all of those maintained here are really valid species.

Pithecolobium dulce (Roxb.) Benth. Lond. Journ. Bot. 3: 199. 1844. *Mimosa dulcis* Roxb. Pl. Coromand. 1: 67. 1795. *P. littorale* Britt. & Rose ex Record, Trop. Woods 11: 15. 1927 (type from Gualán, Zacapa, S. J. Record 107). *Jaguay*; *Shahuay*; *Madre de flecha*.

Dry, brushy or thinly forested plains or hillsides, often in coastal thickets, 500 meters or less; Baja Verapaz; El Progreso; Zacapa; Chiquimula; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu; Quiché; Huehuetenango; San Marcos. Mexico; Honduras to Salvador and Panama; northern South America; naturalized in the Old World tropics, and originally based on material from Coromandel.

A shrub or small tree, seldom more than 10 meters high, often flowering when only a shrub of 1-2 meters, the crown generally broad and spreading or rounded, the trunk often crooked, the bark grayish, the branches armed with short stout sharp spines; branchlets and leaves glabrous or nearly so; petiole bearing an orbicular gland at the apex, the pinnae 1 pair; leaflets 1 pair, obovate to suborbicular, oblique, subcoriaceous, 3-7 cm. long, rounded or emarginate at the apex, sometimes obtuse; peduncles slender, axillary, equaling or shorter than the leaves, sometimes forming terminal panicles; flower heads 2-3 cm. in diameter, white or pinkish; calyx 1.5 mm. long; corolla 3 mm. long, minutely sericeous; stamen tube included; legume linear, curved or coiled, 8-12 mm. wide, somewhat compressed and fleshy, often red, glabrate; seeds large, black, shining.

Called "tsuiche" (Maya), "piliil," and "chucúm blanco" in Yucatan; "mongollano," "mangollano," "mongollano blanco," "espino," "guachimol" (Salvador). This has been reported from Guatemala as *P. Unguis-cati* (L.) Mart., a West Indian species apparently unknown in continental North America. It is an abundant tree on the dry hillsides and plains of the lower Motagua Valley and on the Pacific plains. It is one of the common shade trees about dwellings in the dry regions, since it withstands drought and heat better than most trees, and one of the commonest sights of the Pacific cattle country is a saddled horse or mule tied to a tree of *Pithecolobium dulce*. The wood is reddish brown, the sapwood yellowish; hard and heavy, the grain interwoven, fine-textured; strong but brittle, not easy to work, takes a high polish, is durable. It is used commonly for general construction, fence posts, and fuel. The bark yields a yellow dye and is used for tanning skins. The gum exuding from the trunk is transparent and deep reddish brown;

dissolved in water it makes a good mucilage. The flowers are much frequented by bees and are said to yield a good quality of honey. The fallen pods are eaten by stock of all kinds and by wild animals. The whitish or reddish aril surrounding the seeds is acidulous, and macerated in water it makes a beverage suggestive of lemonade. The low plants make good hedges, since they withstand close pruning and the browsing of animals. The commonest name for the tree in Mexico is "guamúchil" (of which the name "guachimol" of Salvador is probably a variant); it is derived from a Nahuatl name signifying "snake jaws."

Pithecolobium erythrocarpum Standl. Field Mus. Bot. 12: 168. 1936. *Cajoba Recordii* Britt. & Rose, N. Amer. Fl. 23: 31. 1928, not *P. Recordii* Standl. 1929.

Moist thickets or forest at low elevations, British Honduras; type collected near the Botanic Station, lower Belize River, S. J. Record.

A shrub or small tree, 9 meters high or less, the trunk 15 cm. in diameter, the branchlets and petioles densely brown-pubescent; glands of the petiole and rachis very small; pinnae 2-3 pairs; leaflets 8-11 pairs, oblong, 1.5-4 cm. long, green above and puberulent or glabrate, paler beneath, pubescent or glabrate, obtuse, rounded and oblique at the base; peduncles axillary, slender, 5-7 cm. long, bearing above the middle a linear bract 4 mm. long; bractlets much shorter than the calyx; calyx 2.5-3 mm. long, glabrous except on the teeth; corolla white, slender-tubular, 10 mm. long, glabrous except on the teeth; stamen tube exserted; legume about 12 cm. long and 1 cm. thick or less, subterete, bright red, strongly constricted between the seeds, puberulent, the seeds large, oval, black.

Pithecolobium graciliflorum Blake, Contr. Gray Herb. 52: 69. 1917. *Cajoba graciliflora* Britt. & Rose, N. Amer. Fl. 23: 31. 1928.

Known certainly only from the type; British Honduras, Toledo, M. E. Peck 921. Probably also in Chiapas.

A shrub or small tree, the young branchlets, leaf rachis, and peduncles densely short-pilose, the branches unarmed; pinnae 2-3 pairs, with a small orbicular gland between each pair; leaflets 6-12 pairs, broadly oblong to obovate, obtuse, rather thick and firm, 1-4.5 cm. long, glabrous above, pubescent beneath on the veins; peduncles axillary, 2-9 cm. long, the bractlets 5 mm. long, pilose; calyx 4 mm. long, pilose; corolla 10-12 mm. long, the tube glabrous, the teeth pilose; stamen tube almost equaling the corolla; ovary glabrous; legume unknown.

P. escuintlense Lundell (Contr. Univ. Mich. Herb. 7: 15. 1942), described from the region of Escuintla, Chiapas, is probably synonymous with this species.

Pithecolobium halogenes Standl. Carnegie Inst. Wash. Publ. 461: 59. 1935.

Wet forest, at or near sea level, sometimes in mangrove swamps; Izabal (lower slopes of Cerro San Gil, *Steyermark* 39506). British Honduras, the type from Punta Gorda, *W. A. Schipp* 1196.

A shrub or tree, sometimes 10 meters high, unarmed, the trunk 20 cm. or less in diameter, the branchlets brown-tomentulose; pinnae 5-6 pairs, the glands disk-like, depressed; leaflets about 20 pairs, oblong or linear-oblong, 7-11 mm. long, 2.5-4 mm. wide, rounded at the apex, lustrous and glabrous above, paler beneath and glabrous or when young sparsely sericeous; flowers white, umbellate, the umbels many-flowered, long-pedunculate, axillary, the slender pedicels 3-5 mm. long, minutely puberulent or almost glabrous; calyx 1.3 mm. long, sparsely puberulent or glabrate, shallowly dentate; corolla 5 mm. long, glabrous or glabrate; stamen tube included; legume circinate, compressed, about 5-seeded, the valves coriaceous, 1 cm. wide, twisted after dehiscence; seeds subglobose, 4 mm. broad, smooth, gray and black.

Pithecolobium insigne Micheli in Donn. Smith, Bot. Gaz. 20: 285. 1895 (type from San Pedro Sula, Honduras). *P. calostachys* Standl. Contr. U. S. Nat. Herb. 20: 190. 1919.

Brushy or forested plains, 120 meters or less; Retalhuleu; San Marcos. Southern Mexico; British Honduras; Honduras.

A shrub or tree, sometimes 10 meters high, the young branches puberulent or glabrate, the stipular spines 7-10 mm. long; petiole bearing a small apical gland, the pinnae 1 pair; leaflets 1 pair, ovate to oblong-lanceolate, 3-12 cm. long, obtuse to acuminate, pale green, glabrous or nearly so; flowers densely appressed-pilous, white, spicate, the spikes pedunculate, 3-12 cm. long, the bractlets linear-lanceolate or narrower, 2-3 mm. long; calyx 3-4 mm. long; corolla 5-7 mm. long, the stamen tube slightly longer than the corolla or often long-exserted; ovary sessile; legume curved or circinate, 1.5-2 cm. broad, compressed, glabrous or nearly so.

Pithecolobium Johanseni Standl. Trop. Woods 16: 47. Dec. 1, 1928 (type from La Ceiba, Honduras). *P. telense* Britton, N. Amer. Fl. 23: 192. Dec. 20, 1928 (type from Tela, Honduras).

British Honduras (Cocquericot, *H. H. Bartlett* 12070). Atlantic lowlands of Honduras.

A shrub 3 meters high or sometimes a small tree, 10 meters high or less, the branchlets hirsute; leaves short-petiolate, the petiole bearing a large orbicular apical gland; stipular spines 3-4 mm. long or larger; pinnae 1 pair, the leaflets 1 pair, thick, obliquely obovate or broadly obovate, 3-7 cm. long, obtuse or subacute, almost glabrous above, the veins somewhat impressed, hirsute beneath, at least on the nerves, the veins prominent; flowers white, appressed-pilose, in short dense head-like spikes about 2 cm. long; bractlets triangular-acuminate, 2-3 mm. long; calyx 3 mm. long; corolla 8 mm. long, the stamen tube 2-3 cm. long; legume broadly

oblong, subterete, often slightly curved, 5-6 cm. long, 2.5 cm. broad, the valves very hard and woody; seeds large, surrounded by orange-red juicy sweet pulp.

Pithecolobium keyense Britton ex Coker in Shattuck, Bahama Isl. 255. 1905, hyponym; Britt. & Rose, N. Amer. Fl. 23: 22. 1928.

British Honduras: edge of mangrove swamp, All Pines, W. A. Schipp 748. Yucatan Peninsula of Mexico; southern Florida; Bahamas; Cuba.

A large shrub or small tree, usually unarmed, the bark gray, slightly fissured, the branchlets and leaves glabrous; petiole bearing an orbicular gland at the apex, the pinnae 1 pair; leaflets 1 pair, cuneate-obovate or cuneate-oblong, subcoriaceous, 3-7 cm. long, obtuse to rounded or emarginate at the apex; peduncles slender, glabrous, equaling or shorter than the leaves, the flowers salmon-pink, in dense globose heads, these 2-3 cm. in diameter, sometimes paniculate; calyx glabrous, 1.5 mm. long; corolla glabrous, 3 mm. long; stamen tube included; ovary pubescent; legume curved or circinate, brown, compressed, 6-15 cm. long, 8-10 mm. wide; seeds black, lustrous.

The Maya name of Yucatan is "xiac caax." The flowers are very fragrant and much visited by bees. The species has been reported from the Yucatan region as *P. guadalupense* (Pers.) Chapm.

Pithecolobium lanceolatum (Humb. & Bonpl.) Benth. Lond. Journ. Bot. 5: 105. 1846. *Inga lanceolata* Humb. & Bonpl. ex Willd. Sp. Pl. 4: 1005. 1806. *Mimosa ligustrina* Jacq. Fragm. Bot. 29. 1801. *P. ligustrinum* Klotzsch ex Benth. Trans. Linn. Soc. 30: 571. 1875, not Benth. 1844. *P. macrosiphon* Standl. Contr. U. S. Nat. Herb. 20: 191. 1919 (type from Chiapas). *P. Winzerlingii* Britt. & Rose, N. Amer. Fl. 23: 193. 1928 (type from Hillbank, British Honduras, Winzerling 12). *Guachimol*; *Guachimol bat*.

Moist or wet to rather dry thickets or forest, chiefly on plains, 300 meters or less; Petén; Alta Verapaz; Escuintla; Retalhuleu. Mexico; British Honduras to Costa Rica; northern South America.

A small or medium-sized tree, sometimes 12 meters high, the branchlets glabrous or nearly so, the bark smooth or rimose; stipular spines 2 cm. long or shorter; petiole bearing a discoid apical gland, the pinnae 1 pair; leaflets 1 pair, coriaceous or rather thin, pale, glabrous or nearly so, mostly oblong to ovate or obovate and very oblique, 2-7 cm. long, acute or obtuse; flowers whitish, spicate, the spikes dense, 4-12 cm. long, on puberulent peduncles 1-5 cm. long, often forming terminal panicles; bractlets minute, deltoid; flowers puberulent, the calyx 2-3 mm. long; corolla 5-6 mm. long; stamen sheath little if at all exerted; ovary sessile or short-stipitate; legume subterete, almost straight or curved, glabrous, 8-12 cm. long, 1 cm. broad; seeds black, surrounded by a juicy aril.

Called "tucuy" in Tabasco; "siemche" (Maya), "red fowl," "bastard bully tree," "chucum" (Maya), in British Honduras. The

aril surrounding the seed is edible and can be used like that of *P. dulce*.

Pithecolobium leucocalyx (Britt. & Rose) Standl. Field Mus. Bot. 4: 308. 1929. *Samanea leucocalyx* Britt. & Rose, N. Amer. Fl. 23: 34. 1928.

Usually about lagoons or on stream banks, 200 meters or less; Petén. Tabasco; British Honduras.

An unarmed tree of 15 meters, the trunk 45–60 cm. in diameter, the branchlets brown-tomentulose; petioles puberulent or glabrate, bearing a small gland, the pinnae 2–3 pairs; leaflets 4–6 pairs, broadly oblong to obovate or rhombic, 2–5 cm. long, rounded or obtuse at the apex, very unequal at the base, deep green above and glabrous or nearly so, lustrous, paler beneath, puberulent on the nerves or almost glabrous; peduncles slender, axillary or grouped at the ends of the branches, 3–4 cm. long; flowers white, in dense umbels, the pedicels 6 mm. long or shorter; calyx 3 mm. long, densely sericeous; corolla 7 mm. long, white-tomentose; stamens 3–4 cm. long; legume 6–9 cm. long, 2.5 cm. wide, strongly compressed, castaneous, glabrous, obliquely rounded at the apex, rounded and sessile at the base, the valves thin but hard.

Called “wild tamarind” in British Honduras. This has been reported in error from British Honduras as *P. macradenium* Pittier, a species of Panama.

Pithecolobium leucospermum Brandeg. Univ. Calif. Publ. Bot. 10: 182. 1922. *Chloroleucon guatemalense* Britt. & Rose ex Record, Trop. Woods 10: 24. 1927, hyponym; N. Amer. Fl. 23: 37. 1928 (type from Olanchito, Honduras). *C. leucospermum* Britt. & Rose, N. Amer. Fl. 23: 37. 1928. *Yax ec* (Petén, Maya); *Tinta blanca* (Petén).

Moist or dry plains or hillsides, in thickets or thin forest, 650 meters or less; Petén; Izabal(?); El Progreso; Chiquimula; doubtless also in Zacapa; Jutiapa. Western and southern Mexico; Honduras.

A shrub or tree, usually 10 meters high or less, rarely as much as 15 meters, the branches often flexuous, armed with stipular spines 2 cm. long or shorter, sometimes unarmed, the branchlets somewhat pilose or glabrous; petioles slender, bearing a gland near the middle, the pinnae 2–4 pairs; leaflets 5–10 pairs, oblong or obovate, 8–13 mm. long, rounded to subacute at the apex, pilose or glabrate, paler beneath; peduncles slender, 1–2 cm. long, axillary, the flowers yellowish white, in dense globose heads; calyx 2 mm. long, sparsely pubescent, the corolla 3 mm. long; stamen tube shorter than the corolla; legume linear, compressed, 8–18 cm. long, 7–12 mm. wide, straight or slightly curved, glabrous, many-seeded.

Called “guayacán” in Honduras. This has been reported from Petén as *P. tortum* Mart., a South American species that is closely

related and perhaps not different. The wood is bright yellow, lustrous, hard, fairly heavy, easy to work, fine-textured, takes a very high polish; probably durable; not utilized.

Pithecolobium macrandrium Donn. Smith, Bot. Gaz. 40: 3. 1905. *Motilla* (Petén).

Moist or wet forest, often along stream beds, 350 meters or less; Petén; Alta Verapaz (type from Cubilgüitz, *Tuerckheim* 8193). British Honduras.

A large or small tree, 8 meters high or less, the branches puberulent or glabrate, the larger ones bearing slender-conic thick stipular spines as much as 1.5 cm. long, the younger branches with stipular spines 4–10 mm. long, or these sometimes wanting; leaves large, the petiole 3–8 cm. long, the pinnae 10–17 pairs; leaflets 16–40 pairs, oblong, obtuse, apiculate, 9–18 mm. long, pubescent or glabrate, pale beneath; peduncles solitary in the upper leaf axils, pubescent or glabrate, 5–12 cm. long, the flowers white, spicate, puberulent, the spikes dense, 4–8 cm. long; bracts ovate, acuminate, persistent, 2 mm. long or less; calyx 2 mm. long; corolla 10 mm. long, the stamen tube long-exserted; ovary sessile, pubescent; legume curved and coiled, the large seeds black, the aril red.

Called "prickle wood" in British Honduras.

Pithecolobium microstachyum Standl. Journ. Wash. Acad. Sci. 13: 439. 1923.

Brushy rocky slopes, 500–650 meters; Zacapa (near divide on road between Zacapa and Chiquimula, *Standley* 73800). Salvador (type from La Unión) and Honduras.

A small tree, commonly about 7 meters high, the young branchlets puberulent or hirtellous, armed with stout straight spines 1–1.5 cm. long; petioles slender, glabrous or puberulent, bearing at the apex a conspicuous short-columnar gland, the pinnae 1 pair; leaflets 1 pair, subcoriaceous, often very lustrous, oblong-obovate or oval-obovate, asymmetric, 1.5–7 cm. long, obtuse or rounded at the apex, very obliquely rounded at the base, glabrous or nearly so, the venation prominent and reticulate; flowers spicate, the spikes numerous, slender-pedunculate, forming small lax panicles, 1–3 cm. long, many-flowered, dense or often interrupted below, the flowers closely sessile; bracts lanceolate, persistent, almost as long as the calyx; calyx 1 mm. long, puberulent; corolla 2 mm. long, minutely strigillose; stamen tube very short, not exserted, the filaments white; legume short-stipitate, curved or coiled, glabrate, 8–10 mm. wide; seeds black.

Known in Salvador by the names "mongollano," "guayacán negro," and "uña de gato."

Pithecolobium pachypus Pittier, Contr. U. S. Nat. Herb. 20: 457. 1922. *Tucuy* (Petén, Maya).

Moist or dry thickets, often in second growth, 200 meters or less; Petén. Southern Mexico; British Honduras; Salvador, the type collected near San Salvador.

A small tree, the bark brownish gray, the branchlets puberulent or glabrate; stipular spines stout, 2 cm. long or less; petiole bearing a terminal sessile conic gland, the pinnae 1 pair; leaflets 1 pair, ovate to lance-oblong, 3-7 cm. long, pale green, acute to obtuse or emarginate, very asymmetric, glabrous or nearly so; flowers white, spicate, the spikes dense or interrupted, 3-5 cm. long, pedunculate, often somewhat paniculate; bractlets narrow, minute; flowers densely pubescent, the calyx 3 mm. long; corolla 5-6 mm. long, the stamen tube twice as long; legume turgid, subterete, 6-8 cm. long, 1.5-2 cm. thick, the valves very thick and woody, glabrous, straight or curved; seeds 2-4, ovoid, black, lustrous, subtended by a juicy aril.

Known in Salvador as "guachimol" or "nacascolo." The pods formerly were used there for making ink. The species can be separated with certainty from *P. lanceolatum* only when pods are present, and it may be that it is more common and widely distributed than has been supposed, since most available specimens of the group are with flowers only.

***Pithecolobium Peckii* Blake, Contr. Gray Herb. 52: 71. 1917.**

Known only from the type, *M. E. Peck* 738, from British Honduras, the locality unknown.

A small gnarled tree with hard wood, growing in wet ground, the branchlets and leaves glabrous or somewhat puberulent; stipular spines 2-3 mm. long; pinnae 2-3 pairs, the rachis bearing a clavate gland; leaflets 5-11 pairs, oval or oblong, 1-2.5 cm. long, truncate, rounded, or retuse at the apex, reticulate-veined on both surfaces; flowers spicate, the spikes axillary in fascicles of 3, oblong, 2.5-3.5 cm. long, sessile; bractlets deltoid, 1 mm. long or less; calyx 1.2 mm. long, strigillose; corolla 6.5 mm. long, the tube glabrous, the teeth strigillose; stamen tube shorter than the corolla; ovary stipitate, densely puberulent; legume circinate, 12 cm. long, 12-17 mm. wide, subligneous, glabrous, about 11-seeded; seeds brownish black, 7.5-15 mm. long, subtended by a large aril.

***Pithecolobium pistaciifolium* Standl. Carnegie Inst. Wash. Publ. 461: 59. 1935.**

Known only from the type: British Honduras, river bank, Río Grande, *W. A. Schipp* 1260.

A tree of 10 meters, the trunk 20 cm. in diameter, the branchlets glabrous, unarmed; stipular spines 3-4 mm. long; pinnae 3-4 pairs, the rachis bearing large clavate glands; leaflets 7-8 pairs, oblong-lanceolate, 1-3 cm. long, 5-8 mm. wide, gradually narrowed to the obtuse apex, cuneate-obtuse at the base, glabrous except along the costa; flowers white, spicate, the spikes arising from the older branches, 3 cm. long, dense, many-flowered, sessile; calyx 1 mm. long, glabrous, shallowly dentate; corolla glabrous, 5 mm. long; stamen tube exserted; fruit unknown.

Pithecolobium platylobum (Spreng.) Urban, Symb. Antill. 5: 360. 1908. *Acacia platyloba* Spreng. Syst. 3: 144. 1826. *P. sericiflorum* Benth. Lond. Journ. Bot. 5: 105. 1846.

In forest or thickets on lake shores; Petén. Yucatan Peninsula of Mexico; Colombia and Venezuela.

A woody vine or small tree, the branches glabrous, bearing short recurved stipular spines; petiole glabrous, bearing an oblong sessile gland, the pinnae 2 pairs; leaflets 2-3 pairs, obovate or orbicular, obtuse or usually rounded at the apex, 1-2.5 cm. long, glabrous; peduncles slender, axillary, 1-2 cm. long, the flowers capitate; calyx 5-6 mm. long, glabrous; corolla 12-14 mm. long, pubescent, the slender calyx tube long-exserted; legume 10-15 cm. long, 2-3 cm. wide, strongly compressed and flat, short-stipitate, the valves thin.

The Maya name of Yucatan is "chacojó," and the plant is known there also as "anzuelillo" and "sierrilla." Concerning its occurrence in Yucatan, Dr. Román S. Flores has supplied the following data: "This tree is very curious because it is a climber, growing over other trees and supporting itself upon them, ascending to a height of 10-12 meters. The small branches by which it supports itself are doubled at an acute angle. The wood is very hard, and the *arrieros* use it to make hooks for the cinches of their pack saddles. The tree is curious in another respect, that its lower trunk is more slender than the parts above, for when the upper trunk passes over another tree, it supports itself upon it and forms an angle and becomes thicker. The wood is hard and when it is dry it is difficult to cut it with a machete."

Pithecolobium Recordii (Britt. & Rose) Standl. Field Mus. Bot. 4: 212. 1929. *Zygia Recordii* Britt. & Rose in Standl. Trop. Woods 7: 6. 1926. *P. disciferum* Lundell, Contr. Univ. Mich. Herb. 6: 27. 1941 (type from Campeche).

Moist or wet forest, usually on stream banks, 300 meters or less; Petén; Alta Verapaz; Izabal (type from Los Andes region, *S. J. Record* 5); Retalhuleu. Tabasco; British Honduras.

An unarmed tree, commonly 10 meters high or less, the crown low and spreading, the trunk 20 cm. or less in diameter, the branchlets glabrous; leaves petiolate or almost sessile, the pinnae 1 pair; leaflets 2, 3, or 4 in each pinna, oblong to ovate or obovate, 4-9 cm. long, acute to obtuse or retuse, glabrous, bright green; flowers white or pinkish, fragrant, in short, sessile or short-pedunculate, head-like spikes, these mostly arising from defoliate nodes, glabrous; calyx 1.5 mm. long or less; corolla 5 mm. long; stamen tube long-exserted; legume compressed, linear, strongly curved, 5-15 cm. long, 1 cm. wide, glabrous, usually dark red; seeds compressed, orbicular, 1 cm. broad.

Called "turtle bone" in British Honduras. It is by no means certain that this species is distinct from *P. longifolium* (Humb. & Bonpl.) Standl., which occurs from Nicaragua to Panama.

Pithecolobium Saman (Jacq.) Benth. Lond. Journ. Bot. 3: 216. 1844. *Mimosa Saman* Jacq. Fragm. Bot. 15. 1800. *Samanea Saman* Merrill, Journ. Wash. Acad. Sci. 6: 47. 1916. *Cenícero*; *Algarrobo* (Petén).

Dry to wet forest, chiefly on plains, often in second growth or in pastures, 500 meters or less; Petén; Izabal; Jutiapa; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu; doubtless in all the Pacific coast departments. Yucatan Peninsula of Mexico; British Honduras to Salvador and Panama; South America; planted and naturalized in the West Indies and the Old World tropics.

A large tree, sometimes 30 meters high, with a broad dense spreading crown, the trunk usually short and very thick, the bark pale, the branchlets unarmed, densely short-pilose with usually yellowish hairs; leaves large, the pinnae 2-6 pairs, a small orbicular gland present on the rachis between each pair; leaflets 2-8 pairs, broadly oblique-oblong to obovate or rhombic, 2-4 cm. long, obtuse or rounded at the apex, very oblique at the base, densely velutinous-pilose beneath, in age glabrate and lustrous above, finely reticulate-veined; peduncles axillary, 6-12 cm. long, the flowers in dense umbels, white or pink, the pedicels 2-5 mm. long; calyx tubular-campanulate, yellowish-tomentulose, 6-8 mm. long; corolla pilose, 10-12 mm. long, the stamens 4-5 mm. long, often pinkish, the tube included; legume compressed, linear, straight or slightly curved, 10-20 cm. long, 1-2 cm. wide, short-rostrate, acute at the base, glabrate, the valves rather thick; seeds oblong, 5-8 mm. long.

Sometimes known in Salvador as "carreto" and "zorra"; "algarrobo" (Yucatan). The most usual English name is "rain tree." The tree is well known throughout the lowlands of Central America and is abundant in many regions. The fallen leaves and pods are much eaten by stock, and on this account the trees often are left for shade in land cleared for pasture. The wood of young trees is light and soft, easy to cut, and brown, but in old trees it is hard, heavy, fibrous, very cross-grained, difficult to work, and deep chocolate-brown or almost black. The timber is of little or no commercial importance, but the wood has long been valued in Central America for wheels of the two-wheeled oxcarts. Such wheels sometimes are made from single cross sections of the thickest trunks, and they are said to be very durable. The specific name is the vernacular name used in Venezuela. The name "rain tree" is said to be given because the leaflets fold together in cloudy or rainy weather or at night.

Pithecolobium saxosum Standl. & Steyer. Field Mus. Bot. 23: 163. 1944.

Brushy, usually rocky hillsides or plains, sometimes along arroyos, 200–660 meters; endemic; Zacapa (near Zacapa); Chiquimula (type from Quebrada Shusho, above Chiquimula, on the road to Zacapa, *Standley* 74367).

A small tree about 5 meters high, the branchlets short, irregular, densely hirtellous, the stipular spines stout, rigid, 7–10 mm. long, straight; petioles 1.5–2.5 cm. long, slender, densely hirtellous, bearing at the apex a sessile crateriform gland, the pinnae 1 pair; leaflets 1 pair, coriaceous, oval to broadly oblong-obovate, 2.5–4.5 cm. long, 1.5–2.5 cm. wide, rounded at the apex and often emarginate, rounded at the base or broadly and obtusely cuneate, usually lustrous above, densely velutinous-puberulent, rather densely velutinous-pilosulous beneath, the nerves and veins prominent and conspicuous beneath; flowers spicate, the spikes forming small lax panicles, 1–2 cm. long, dense or usually interrupted below, 8 mm. thick, many-flowered, the flowers closely sessile; bracts oblong-lanceolate, persistent, scarcely 1 mm. long, puberulent; calyx scarcely more than 1 mm. long, densely whitish-puberulent; corolla 3 mm. long, minutely sericeous; legume unknown.

Pithecolobium Standleyi (Britt. & Rose) Standl. Field Mus. Bot. 18: 509. 1937. *Cajoba Standleyi* Britt. & Rose, N. Amer. Fl. 23: 32. 1928.

Wet mixed forest, 300–900 meters; Izabal (Cerro San Gil, *Steyermark* 41887). Mountains of Costa Rica.

A shrub or a sparsely branched tree as much as 8 meters high, the branches slender, ferruginous-pubescent when young; leaves on short slender petioles, the pinnae 1 pair, the rachis very slender, densely ferruginous-puberulent; leaflets usually 3 pairs, membranaceous, oblong to lance-oblong or oblong-obovate, 5–11 cm. long, acute or acuminate, oblique at the base, rounded to broadly obtuse-cuneate, green above, puberulent on the nerves, slightly paler beneath, puberulent on the nerves and veins; peduncles very slender, axillary, puberulent, 5 cm. long or shorter, bearing a single head of greenish flowers; legume about 10 cm. long, bright red, subterete, strongly constricted between the seeds, pendent; seeds turgid, black and lustrous, 1 cm. long.

The single Guatemalan collection is in fruit, and flowering material may show that it is a distinct species. It grows, however, under much the same conditions as the Costa Rican tree, and the extension of range is not an unnatural one.

Pithecolobium Stevensonii (Standl.) Standl. & Steyer. Field Mus. Bot. 23: 164. 1944. *Inga Stevensonii* Standl. Trop. Woods 23: 7. 1930.

Moist or wet, mixed forest, sometimes in *Achras* forest, 200 meters or less; Petén; Alta Verapaz; Izabal. British Honduras, the type from Freshwater Creek, *D. Stevenson* 65.

A slender tree, unarmed, glabrous almost throughout, the trunk 15 cm. or less in diameter; leaves subsessile, the pinnae 1 pair; leaflets 3–4 pairs, on petioles 5–7 mm. long, subcoriaceous, oblong-lanceolate, 12–20 cm. long, 4–5 cm. wide, short-acuminate or long-attenuate, acute or attenuate at the base, somewhat paler beneath, lustrous above; flowers in short head-like spikes arising from old wood, the spikes 4–6 mm. long, pedunculate, the peduncles ferruginous-puberulent; calyx 1 mm. long, minutely puberulent; corolla sparsely puberulent, slender, 9–10 mm. long; immature legume linear, almost straight, compressed and flat, about 12 cm. long and 1 cm. wide, densely ferruginous-tomentulose.

Called “turtle bone” in British Honduras. The sapwood is yellow or slightly brownish, very dense, rather horn-like, fine-textured, tough and strong.

Pithecolobium tenellum (Britt. & Rose) Standl. Field Mus. Bot. 12: 216. 1931. *Cajoba tenella* Britt. & Rose, N. Amer. Fl. 23: 31. 1928.

In forest along streams, 300 meters or less; Izabal (Montaña del Mico near Bananera, *Steyermark* 38286). British Honduras (type from Stann Creek, *S. J. Record*); Chiapas; Atlantic lowlands of Honduras.

An unarmed shrub or tree, sometimes 6 meters high but often flowering when only a shrub, the branchlets densely brown-tomentose; petioles and rachis densely brown-tomentose, the glands cupular, small, sessile, the pinnae usually 3 pairs; leaflets 8–10 pairs, lance-oblong, acute or subacute, often subcordate at the base, mostly 2.5–3 cm. long, puberulent beneath on the costa, elsewhere glabrous or nearly so; peduncles axillary, very slender, 4–7 cm. long, bearing near the apex a conspicuous bract 4 mm. long; flowers greenish white, in dense globose heads, the bractlets about as long as the calyx, inconspicuous; calyx 2 mm. long, puberulent on the teeth; corolla 7 mm. long, glabrous except on the lobes; legume 6–15 cm. long, 1 cm. or less in diameter, subterete, deeply constricted between the seeds, pendent, bright red, puberulent, the valves somewhat fleshy, usually with numerous seeds, these large, black and shining.

Called “barba de jolote” in Honduras. The flowers are sweet-scented.

Pithecolobium Tonduzii (Britt. & Rose) Standl. Field Mus. Bot. 4: 308. 1929. *Cajoba Tonduzii* Britt. & Rose, N. Amer. Fl. 23: 30. 1928. *Utzeche* (Sacatepéquez); *Guanacaste* (Huehuetenango).

Moist, thin or dense, usually mixed forest, 1,800 meters or less; Alta Verapaz; Izabal; Guatemala (type from Volcán de Pacaya,

A. Tonduz 450); Sacatepéquez; Chimaltenango; Sololá; Quezaltenango; San Marcos; Huehuetenango; perhaps endemic but probably also in Chiapas.

A large shrub or a tree, sometimes 20 meters high, unarmed, the young branchlets puberulent or almost glabrous; leaves very large, with small cupular glands on the rachis and petiole, the pinnae 5–8 pairs; leaflets about 12 pairs, oblong or lance-oblong, 1.5–2 cm. long, obtuse or subacute, palmately several-veined at the base, glabrous or nearly so, ciliate when young, paler beneath; peduncles axillary or sometimes on old wood, often fasciculate, 4.5 cm. long or shorter; flowers white, in dense globose heads, puberulent, the bractlets minute; calyx 3 mm. long; corolla 5–6 mm. long, the stamens short; legume about 13 cm. long and 1 cm. thick, pendent, subterete, red, the seeds numerous, large, black.

This is one of the most distinct of the *Cojoba* species described by Britton and Rose. The bark is said to be employed in Huehuetenango for tanning leather.

Pithecolobium Tuerckheimii (Britt. & Rose) Standl. & Steyerl. Field Mus. Bot. 23: 164. 1944. *Cojoba Tuerckheimii* Britt. & Rose, N. Amer. Fl. 23: 30. 1928.

Moist or wet, mixed forest, 1,500 meters or less; endemic; Alta Verapaz (type from Cobán, *Tuerckheim* II.1769); Izabal.

An unarmed shrub or small tree, 6 meters high or less, the young branchlets thinly brown-tomentulose; leaves rather large and fern-like, the rachis puberulent, the glands cupular, sessile, small, the pinnae about 15 pairs; leaflets 20–30 pairs, falcate-linear, 8–12 mm. long, glabrous, obtuse or subacute; peduncles axillary, slender, often fasciculate, 3–5 cm. long, bearing a large curved gland near the apex; flowers greenish white, in dense globose heads, the bractlets minute; calyx 1 mm. long, the teeth puberulent; corolla 4 mm. long, with puberulent lobes; stamen tube not exerted; legume unknown.

Pithecolobium vulcanorum Standl. & Steyerl. Field Mus. Bot. 23: 164. 1944. *Cojoba guatemalensis* Britt. & Rose, N. Amer. Fl. 23: 30. 1928, not *P. guatemalense* Standl. 1929.

Moist mixed forest, sometimes in wooded *barrancos*, 1,300–1,800 meters; Sacatepéquez (type from Volcán de Acatenango, *J. D. Smith* 2831). Salvador; Honduras.

A tall tree, sometimes 25 meters high, with spreading crown, the branchlets densely brown-tomentulose, unarmed; pinnae 4–10 pairs; leaflets mostly 8–15 pairs, narrowly oblong, 8–15 mm. long, obtuse, glabrous, deep green above, pale beneath; glands of the rachis small, orbicular, sessile; peduncles axillary, about 3 cm. long; flowers unknown; legume 8–11 cm. long, about 1 cm. in diameter, subterete, slightly if at all constricted between the seeds, usually strongly curved, dark red, brown-tomentulose, sessile or nearly so, the valves somewhat fleshy; seeds large, black.

Called "agüijote" in Salvador. This was once reported from Guatemala as *P. floribundum* Benth.

Pithecolobium Zollerianum Standl. & Steyer. Field Mus. Bot. 22: 343. 1940. *Plumillo*.

Moist mixed forest, 1,300–1,800 meters; endemic; Quezaltenango; San Marcos (type collected on southern slopes of Volcán de Tajumulco, above Finca El Porvenir, *Steyermark* 37440).

A tree of 15–18 meters, unarmed, the branchlets densely brown-tomentulose; leaves large, the petiole bearing a small depressed gland below the apex, the pinnae 8–13 pairs; leaflets 8–18 pairs, oblong, 1.5–2 cm. long, 5–7 mm. wide, rounded or very obtuse at the apex, very oblique at the base, green and lustrous above, puberulent only on the costa, paler and yellowish beneath, glabrous or sparsely appressed-pilosulous; peduncles axillary, geminate, 8–12 cm. long, the flowers umbellate, the umbels dense and many-flowered, the bracts minute, the pedicels 2 mm. long or less; calyx 2.5 mm. long, minutely puberulent or almost glabrous; corolla 6–7 mm. long, sparsely puberulent or glabrate; stamens greenish white, 2.5 cm. long; legume coiled into a circle, 1.5 cm. wide, compressed, glabrous, the valves coriaceous or lignescent; seeds compressed, oval-orbicular, brownish ochraceous, 8 mm. long, lustrous.

This is a common tree along the road below Santa María de Jesús, Quezaltenango, growing abundantly on inaccessible *barranco* slopes. It is of handsome appearance, especially because of the dense, rich green, fern-like foliage. The species was named for Mr. Erich Zoller of Finca El Porvenir, who greatly facilitated the junior author's explorations on the Volcán de Tajumulco.

PROSOPIS L.

Trees or shrubs, usually armed with stipular spines; leaves bipinnate, the pinnae few, the leaflets small, few or numerous; stipules small or none, the glands of the leaves small or none; flowers small, yellowish, 5-parted, in axillary spikes or racemes; calyx campanulate, shallowly dentate; petals connate below the middle or finally free, valvate; stamens 10, free, short-exserted; anthers tipped with a small deciduous gland; ovary sessile or stipitate, many-ovulate, the style filiform, the stigma small, terminal; legume linear, compressed or turgid, indehiscent, the exocarp thin or coriaceous, the mesocarp spongy or indurate, the endocarp cartilaginous or papyraceous; seeds usually ovate and compressed.

The number of species is uncertain, but probably less than 20, in the warmer regions of both hemispheres but chiefly in America. Britton and Rose recognized several segregates, one of which, *Strombocarpa*, probably is a good genus. Only one species is known from Central America.

Prosopis juliflora (Swartz) DC. Prodr. 2: 447. 1825. *Mimosa juliflora* Swartz, Prodr. Veg. Ind. Occ. 85. 1788. *Neltuma juliflora*

Raf. Sylva Tell. 119. 1838. *N. Bakeri* Britt. & Rose, N. Amer. Fl. 23: 185. 1928. *Nacascot*, *Nacascolote* (Zacapa).

Dry hills and plains of the lower Motagua Valley, in thickets or open forest, also along the Pacific coast, often on salt flats, 700 meters or less; Zacapa; El Progreso; Retalhuleu; San Marcos. Southwestern United States; Mexico; Salvador to Panama; West Indies; northern South America.

A shrub or small tree, sometimes 12 meters high but usually lower, the crown spreading and depressed, the branches armed with stout straight spines 1-4 cm. long, the branchlets glabrous or short-pilose; leaves petiolate, the pinnae 1-8 pairs; leaflets 10-20 pairs, oblong or linear-oblong, mostly 1-1.5 cm. long, obtuse or rounded at the apex, glabrous or sparsely pubescent, sometimes conspicuously veined; flowers greenish yellow, sessile or nearly so, the spikes dense, 5-10 cm. long; calyx 1 mm. long, glabrous or puberulent; corolla 2.5-3 mm. long, the petals acute, tomentulose or pilosulous on the margins and within; stamens 4-5 mm. long; legume compressed, linear, glabrous, falcate or almost straight, 7-20 cm. long, 8-15 mm. wide, not or scarcely constricted between the seeds.

The Maya name of Yucatan is "catzimec," and the name "mezquite," of Nahuatl derivation, is used there as well as throughout Mexico and in southwestern United States; "carbón" (Salvador); "algarrobo" (Honduras). Mezquite is one of the best-known trees of northern Mexico and southwestern United States, but in Central America it is neither important nor common, being found almost exclusively in thickets along the Pacific coast, close to the shore. In its wide range it varies greatly in size and habit. In Central America it is a large shrub or small tree, but in the northern part of its range it is only a low shrub with a huge mass of thick, woody roots. Along the Mexican border within the United States, mezquite is an important source of fuel, but it is the large roots, not the stems, that are so used. In Guatemala it is employed as fuel and sometimes for fence posts or minor construction. The pods are filled with a sweet meal-like substance that has an agreeable flavor and was much used, ground, for food by some of the Mexican Indians. The pods are eaten greedily by stock and are very nutritious. In the Hawaiian Islands, mezquite has become thoroughly naturalized over large areas; and there the pods are collected in great quantities, ground in a special mill, and used as stock feed. The fragrant flowers are much visited by bees, which obtain from them a good quality of honey. The bark is sometimes employed in Mexico for tanning and the wood is suitable for charcoal. There is exuded from the trunk an amber-colored, translucent gum similar to gum arabic, for which it often is substituted in Mexico. The wood is rich, dark

brown or mahogany, with fine, wavy, dark-colored lines, the sapwood yellow, usually thin; more or less fragrant, with an odor suggestive of violets; rather hard and heavy, the specific gravity 0.77; grain irregular, rather coarse-textured; tough and strong, easy to work, finishes smoothly but does not take a high polish; resistant to decay. It is suitable for railway ties, vehicle construction, and fence posts, but is most used as fuel, for which it is of superior quality. In Texas it has been utilized for paving blocks.

The classification of the various forms of mezquite always has been found difficult, principally because of not very justifiable multiplication of specific names by optimistic taxonomists. There can be little doubt that most of the material from Mexico and Central America is referable to *P. juliflora*, the variations being, at most, varieties or forms that are not clearly characterized. There is a question as to whether the proper name for the species is not *Prosopis chilensis* (Molina) Stuntz, a name used in various recent publications treating Mexico and Central America. South American botanists maintain that this is a distinct species, but they have not demonstrated in just what respects the Chilean plant differs from the North American forms.

SCHRANKIA Willdenow

Plants perennial, erect or prostrate, herbaceous or suffrutescent, the stems usually angulate, armed with short recurved prickles; leaves bipinnate, sensitive, the petiole eglandular, the leaflets usually numerous, small; stipules setaceous; flowers small, usually rose-colored, perfect or polygamous, 5-4-parted, sessile in globose heads or short spikes, the peduncles axillary, solitary or fasciculate; calyx minute; petals connate to the middle; stamens as many as the petals or twice as many, free, exserted, the anthers small, eglandular; ovary subsessile, many-ovulate, the style filiform, the stigma terminal, obtuse; legume linear, acute or attenuate, densely aculeate, the valves finally separating from the thickened persistent margins; seeds longitudinal, oblong, somewhat 4-gonous.

An American genus, of which one other species occurs in Panama. Britton and Rose recognize 27 species from North America, but the number of valid species in that area is probably less than half that number.

Schrankia leptocarpa DC. Prodr. 2: 443. 1825.

In thickets, 325 meters; Santa Rosa (near Chiquimulilla, *Standley* 79249). Costa Rica; Panama; West Indies; South America.

Plants prostrate or suberect, the stems slender, sometimes a meter long but usually shorter, angulate, glabrous or pilosulous, densely armed with short recurved

prickles; petioles and leaf rachis aculeate, the pinnae 2-3 pairs; leaflets 10-20 pairs, thin, ciliate, oblong, 6-10 mm. long, rounded at the apex, the venation obscure; peduncles solitary, 1.5 cm. long or shorter, the heads small, globose, the flowers rose-pink; legume linear or subterete, 7-10 cm. long, 4 mm. thick, covered with long slender prickles.

II. CAESALPINIEAE

Leaves bipinnate, at least most of them.

Calyx lobes strongly imbricate; plants often armed with spines.

Valves of the legume longitudinally dehiscent along the middle; leaves bipinnate and simply pinnate *Haematoxylon*.

Valves of the legume not dehiscent along the middle; leaves all bipinnate. *Caesalpinia*.

Calyx lobes valvate or only slightly imbricate; plants unarmed.

Flowers yellow; legume spatulate, 1-seeded *Schizolobium*.

Flowers red; legume linear, ligneous, many-seeded *Delonix*.

Leaves pinnate, 2-foliolate, 1-foliolate, or simple, never bipinnate.

Anthers erect; leaves pinnate.

Petals 5; stamens 5-10; herbs, shrubs, or trees *Cassia*.

Petals 1-2 or none; stamens 2; large trees *Dialium*.

Anthers versatile.

Leaves simple, or with 1-2 leaflets.

Leaves composed of 2 leaflets.

Flowers small, about 7 mm. long; legume indehiscent *Cynometra*.

Flowers 1 cm. long or larger.

Calyx lobes 4; legume indehiscent, ligneous, pulpy within . . . *Hymenaea*.

Calyx lobes 5; legume usually dehiscent, not ligneous, without pulp. *Bauhinia*.

Leaves simple or of a single leaflet.

Petal 1; petiole narrowly winged *Swartzia*.

Petals 5; petioles not winged.

Legume ovoid or globose, not compressed; leaflet remotely serrate. *Zollernia*.

Legume compressed, flat; leaflets or leaves entire.

Petals very unequal; legume winged along the upper suture. . *Cercis*.

Petals subequal; legume not winged *Bauhinia*.

Leaves with 3-many leaflets.

Plants armed with spines.

Legume longitudinally dehiscent along the middle of the valves; leaf rachis not broad and flat *Haematoxylon*.

Legume not dehiscent along the middle of the valves; leaf rachis broad and flat *Parkinsonia*.

Plants unarmed.

Petals 1 or none.

Calyx closed in bud, globose; leaflets 1, or 3-many *Swartzia*.

Calyx 4-lobate, the segments imbricate in bud; leaflets 4 *Crudia*.

Petals 5.

Leaves even-pinnate; legume thick, indehiscent, pulpy within.

Tamarindus.

Leaves odd-pinnate; fruit compressed and flat, thin, not pulpy within.

Flowers red; leaflets 4-6 pairs.....*Phyllocarpus.*

Flowers yellow; leaflets many pairs.....*Poeppigia.*

BAUHINIA L.

Trees or shrubs, often scandent, frequently armed with spines and provided with tendrils, the stems sometimes complanate and perforated; leaves simple, 3-many-nerved, entire or bilobate (composed of 2 more or less connate leaflets), or sometimes 2-foliolate; stipules mostly small and caducous; flowers white to pink, red, or purple, racemose, the racemes simple and terminal or axillary, sometimes paniculate; calyx tube turbinate or elongate, the limb before anthesis entire and closed, or contracted at the apex and 5-dentate, in anthesis variously cleft or with 5 valvate lobes or segments; petals 5, slightly unequal, erect or spreading, imbricate; perfect stamens 10 or fewer, some often reduced to staminodia or altogether suppressed, free or short-connate; anthers ovate to oblong or linear, versatile, the cells longitudinally dehiscent; ovary stipitate or sessile, 2-many-ovulate, the stipe free from the calyx or adnate to the tube; style filiform or very short, the stigma small or variously dilated, often peltate or oblique; legume oblong or linear, straight or oblique, rarely falcate, membranaceous to coriaceous or almost ligneous, 2-valvate or indehiscent, the valves usually elastic; seeds orbicular or ovate, compressed, the testa thin or indurate, with endosperm; cotyledons flat, carnose, the radicle short, straight or somewhat oblique.

Species 200 or more, in the tropics of both hemispheres. Others are known from southern Central America. Sterile specimens that we are unable to place indicate that there are probably two other species represented in Guatemala.

Leaves of 2 distinct leaflets.....*B. sericella.*

Leaves simple, entire or bilobate.

Branches armed with spines.....*B. Pauletia.*

Branches unarmed.

Calyx campanulate, short and broad; plants scandent, usually provided with tendrils.

Valves of the legume not elastic, densely brown-sericeous, thin; calyx lobes triangular.....*B. Herrerae.*

Valves of the legume elastic, glabrate, thick-coriaceous; calyx lobes filiform.
B. hondurensis.

Calyx long and narrow, tube-like, in anthesis denticulate or cleft; plants erect, without tendrils.

Leaves, at least most of them, entire or merely emarginate, the lower leaves sometime shallowly bilobate.

Leaves villosulous or tomentulose beneath.....*B. rubelcruziana.*

Leaves glabrous beneath or nearly so.

Leaves 5-nerved, glaucous beneath.....*B. Jenningsii.*

Leaves 9-nerved, bright green beneath.....*B. pansamalana.*

Leaves all deeply bilobate.

Plants cultivated; petals about 2 cm. wide, pink or white. . . . *B. purpurea*.

Plants native; petals much narrower.

Leaves glabrous; a tall tree. *B. gigas*.

Leaves finely appressed-pilose beneath or puberulent, at least on the nerves; shrubs.

Fertile stamens 10.

Flowers 4-5 cm. long; lobes of the leaves acute or acutish.

. *B. unguolata*.

Flowers 1 cm. long; lobes of the leaves obtuse. *B. Seleriana*.

Fertile stamen only 1.

Lobes of the leaves acuminate or long-acuminate, sometimes abruptly so. *B. Calderonii*.

Lobes of the leaves subacute to very obtuse.

Petals 2; sinus between the lobes of the leaves very narrow.

. *B. dipetala*.

Petals 5; sinus between the lobes of the leaves broad and open.

. *B. divaricata*.

Bauhinia Calderonii (Rose) Standl. & Steyerl. Field Mus. Bot. 23: 161. 1944. *Pata de venado*.

Moist or rather dry thickets or mixed lowland forest, 1,000 meters or lower; Escuintla; Guatemala; Suchitepéquez; Retalhuleu; cultivated in the Jardín Botánico in Guatemala. Salvador, the type from San Julián, Sonsonate.

A slender unarmed shrub about 1.5 meters high, sometimes perhaps larger, the young branches sparsely puberulent or almost glabrous; petioles very slender, 2-5 cm. long, glabrous or nearly so; leaf blades 5-15 cm. long, 13 cm. wide or narrower, cleft to about the middle, truncate to cordate at the base, very thin, green and glabrous above, slightly paler beneath, usually minutely strigillose over the whole surface but sometimes merely puberulent on the nerves and veins, the lobes deltoid-ovate to lance-deltoid, rather abruptly acuminate or often very long-acuminate; inflorescences short and laxly few-flowered, short-pedunculate, the long slender pedicels densely puberulent; calyx green, about 1 cm. long, puberulent; legume glabrous, 6-10 cm. long, 10-13 mm. wide, abruptly acuminate, attenuate at the base.

Bauhinia dipetala Hemsl. Diag. Pl. Mex. 48. 1880. *Hierba de culebra*.

At 1,200-1,300 meters; Huehuetenango (determination somewhat uncertain). Southern Mexico; British Honduras (El Cayo, in fruit, probably referable here); Cuba.

A shrub or small tree, sometimes 6 meters high with a trunk 7 cm. in diameter, usually lower, the branchlets puberulent or glabrate; leaves on slender petioles 2-3 cm. long, bilobate to about the middle, 5-10 cm. long, truncate or shallowly cordate at the base, 7-9-nerved, glabrous above, minutely appressed-pilose beneath

but appearing glabrous to the naked eye; racemes short, few-flowered, the flowers short-pedicellate; flower buds narrow, 1 cm. long or shorter; calyx 1.5 cm. long; petals 2, about 6 mm. long, pilose, whitish; fertile filament 2 cm. long, glabrous, the anther 6 mm. long, lanate on one side; ovary long-stipitate, hirsute; legume coriaceous, 8–15 cm. long, 1–1.5 cm. wide, glabrous, lustrous, on a stipe 2 cm. long.

Bauhinia divaricata L. Sp. Pl. 374. 1753. *Casparea divaricata* HBK. ex Jackson, Ind. Kew. 449. 1895. *Casco de chivo*; *Pata de vaca* (Petén); *Tsulotoc* (Petén, Maya); *Pie de cabra*.

Wet to dry thickets, 1,000 meters or less; Petén; Alta Verapaz; El Progreso; Zacapa; Retalhuleu. Southwestern Texas; Mexico; British Honduras to Honduras; West Indies.

An erect shrub or small tree 1–8 meters high, the branchlets pubescent or glabrate; leaves petiolate, chartaceous or membranaceous, 4–12 cm. long, often broader than long, cordate or truncate at the base, puberulent to glabrous above, usually densely pilose beneath with short, appressed or sometimes spreading hairs, bilobate, the lobes usually obtuse or subacute, somewhat divaricate, the sinus broad and open; racemes short and dense, with several or numerous flowers, pubescent, the pedicels short; calyx 12–20 mm. long, tomentulose, narrow, with short subequal filiform teeth; petals at first white, turning pink, glabrous, 2–2.5 cm. long, oblong, acuminate, slender-unguiculate; fertile stamen 1, twice as long as the petals; legume 5–12 cm. long, 9–15 mm. wide, long-stipitate, puberulent or glabrous; seeds 5–10.

Called “cowfoot” in British Honduras, a translation of the Spanish name, which refers to the leaf-shape, similar in outline to the print left in mud by a cow’s foot; “calzoncillo” (Yucatan, “breeches,” also referring to the leaf-shape); “tsulubtoc,” “utsomeltoc” (Yucatan, Maya); “casco de venado” (Honduras). In Yucatan the tough inner bark is sometimes utilized to make coarse rope or twine.

Bauhinia gigas Lundell, *Phytologia* 1: 213. 1937.

Known only from the type, collected on a limestone hill, in advanced forest, Valentín, El Cayo District, British Honduras, *C. L. Lundell* 6298.

An unarmed tree 40 meters high, the trunk 45 cm. in diameter, the branchlets slender, glabrous; petioles very slender, 3–4.5 cm. long, glabrous; leaf blades membranaceous, broadly ovate, 7–14.5 cm. long, 6–12.5 cm. wide, 7-nerved, finely reticulate-veined, glabrous, dark green above, paler beneath, bilobate to below the middle, the lobes divaricate, subobtuse to acuminate, deeply cordate at the base.

Known, apparently, only from sterile material, but noteworthy for the unusual size attained by the tree, which, however, is scarcely to be regarded as a specific character. We have seen no material of this species.

Bauhinia Herrerae (Britt. & Rose) Standl. & Steyerl. Field Mus. Bot. 23: 10. 1943. *Schnella Herrerae* Britt. & Rose, N. Amer. Fl. 23: 206. 1930.

Wet to dry thickets or forest, 300 meters or less; Petén; Alta Verapaz; Izabal. Nayarit to Oaxaca and Yucatan; British Honduras.

A small or large vine, sometimes 18 meters long, provided with numerous tendrils (often absent on herbarium specimens), the branches and inflorescence densely ferruginous-tomentulose; leaves long-petiolate, mostly 3–8 cm. long and about as wide, shallowly or rather deeply cordate at the base, 9-nerved, bilobate to about the middle, the lobes very obtuse or narrowly rounded at the apex, glabrate above, brownish-pilose beneath with more or less appressed hairs; stipules filiform, 6–8 mm. long; racemes terminal, many-flowered, the pedicels 8–15 mm. long, the rachis thick and stout; buds ovoid, apiculate; calyx densely ferruginous-tomentulose, campanulate, 8 mm. long, its teeth deltoid-ovate; petals 1.5–2 cm. long, yellow; stamens glabrous; legume 6–9 cm. long, 1.5 cm. wide, short-stipitate, strongly compressed and flat, densely appressed-pilose with ferruginous hairs, the valves thin, apparently not elastic; calyx in age strongly multicostate; seeds 1–4.

Called “pata de vaca” in Yucatan; “cibiz quibix” (Campeche, Maya). This has been reported from British Honduras and Yucatan as *B. glabra* Jacq., a South American species. In Yucatan the vine has been used from ancient times by the Mayas for fastening the roofs and framework of their houses. The Mayas peel off the bark, double it upon its inner surface, and make large rolls of it that can be kept for a long time. When they wish to use the bark, they moisten it to make it pliable.

Bauhinia hondurensis Standl. Field Mus. Bot. 8: 313. 1931. *Pie de venado*; *Camatashan* (Alta Verapaz).

Dry to wet thickets or forest, 300 meters or less; Alta Verapaz; Izabal; Santa Rosa; Guatemala; Retalhuleu. Honduras, the type collected near Tela.

A large vine, the older stems strongly zigzag, complanate and often with large perforations, provided with numerous tendrils, the young branches and inflorescence densely ferruginous-pilose or tomentulose, the branches glabrate; leaves long-petiolate, often subcoriaceous and lustrous, 9-nerved, shallowly or deeply cordate at the base, bilobate to the middle or more deeply, the lobes acute to rounded at the apex, glabrous above or nearly so, sparsely or rather densely appressed-pilose beneath, in age often almost glabrous; racemes terminal, sometimes paniculate, few-many-flowered, the slender pedicels 6–10 mm. long; calyx in bud broadly ovate, 10-nerved, cuspidate, sericeous, in anthesis campanulate, about 9 mm. long, the lobes subulate, 3–3.5 mm. long; petals 2 cm. long or shorter, obovate-oblong, rounded at the apex, long-attenuate to the base, white or pale green, pilose; perfect stamens 10, shorter than the calyx, the anthers minute;

legume oblong, about 7.5 cm. long and 2.5 cm. wide, broadest near the apex and rostrate, short-stipitate, sparsely appressed-pilose or in age almost glabrous, the valves thick and hard, elastic; seeds 5 or fewer.

This species is noteworthy for its flattened and somewhat ribbon-like, strongly zigzag stems, often with large perforations, which cause this and similar species to receive sometimes the name of "escalera de mono," meaning "monkey ladder." *B. hondurensis* has been confused with *B. cumanensis* HBK., a Venezuelan plant of somewhat uncertain status.

Bauhinia Jenningsii P. Wilson, Bull. Torrey Club 43: 463. 1916. *B. Castilloi* Standl. Field Mus. Bot. 22: 78. 1940 (type from Freshwater Creek Reserve, British Honduras). *Ixactiz*.

Swamp or upland forest, 300 meters or less; Petén. Yucatan; Isle of Pines (Cuba).

A slender shrub or small tree, sometimes 5 meters high, the young branchlets, inflorescence, and legume minutely puberulent; leaves on slender petioles 1.5–2 cm. long, ovate to lance-oblong, entire, 7–15 cm. long, obtuse to acuminate, truncate or rounded at the base, 5-nerved, chartaceous, green above and glabrous, beneath appearing glabrous but glaucous and densely and minutely puberulent; racemes corymbiform, few-flowered, the very slender pedicels 2 cm. long or shorter; calyx red, very slender, 2 cm. long, puberulent; petals slightly longer than the calyx, very narrow, long-unguiculate, sparsely pilose; fertile stamen 1, twice as long as the 9 sterile ones; ovary long-stipitate; legume linear-oblong, 5–9 cm. long, 8–15 mm. wide; seeds oblong, 7–8 mm. long.

Called "cow-tongue" in British Honduras.

Bauhinia pansamalana Donn. Smith, Bot. Gaz. 13: 27. 1888. *Casperea pansamalana* Britt. & Rose, N. Amer. Fl. 23: 216. 1930.

Wet rocky limestone forest, 1,200 meters or less; Alta Verapaz (type collected between Pansamalá and Sacolol, *J. D. Smith* 681); Izabal. Chiapas.

A small tree, sometimes 9 meters high, glabrous except the flowers; leaves long-petiolate, oblong-ovate to broadly elliptic, entire or some of the leaves shallowly bilobate, 7-nerved, 12–25 cm. long, abruptly acuminate or long-acuminate, the lobes, when present, acute, subcordate or rounded at the base, rather stiff and firm, lustrous; racemes small, with few or numerous flowers, the pedicels 1.5 cm. long; buds linear, obtuse, 2 cm. long; calyx puberulent, becoming spathe-like and reflexed; petals linear, long-unguiculate, 2 cm. long; fertile stamens 3, equaling the petals; legume 20–30 cm. long, 2–2.5 cm. wide, glabrous.

Bauhinia Pauletia Pers. Syn. Pl. 1: 455. 1805. *Uña de gato*.

Dry or wet thickets on plains, 900 meters or less; Jutiapa; Santa Rosa. Western Mexico; Salvador; Costa Rica; Panama; West Indies; Venezuela.

A shrub or small tree, sometimes 8 meters high, often subsucculent, the branches long and slender, armed with stout sharp spines 6 mm. long or less, the young branchlets puberulent or villosulous; leaves slender-petiolate, 2-6 cm. long and about as wide, bilobate for one-third their length, rounded or subcordate at the base, the lobes rounded, sparsely or densely pubescent beneath, usually densely pubescent along the veins; racemes with a very stout, nodose, sometimes tortuous rachis, 6-10 cm. long, the stout pedicels 1 cm. long or less, elongate and reflexed in fruit; calyx 5-12 cm. long, its tube 1.5-2 cm. long, minutely strigillose; petals elongate-linear, greenish white; stamens 5, about equaling the petals; legume linear, long-stipitate, minutely velutinous-tomentulose, 25 cm. long or shorter, 12-15 mm. wide, the valves thick and hard, elastic.

This has been reported from Guatemala as *B. microphylla* Vog. In Salvador it is known by the names "pie de cabra," "pie de venado," "garabatillo," and "tripas de vieja." The larger stems often are perforated.

***Bauhinia purpurea* L. Sp. Pl. 375. 1753. *Pie de cabra*.**

Native of southeastern Asia, cultivated in tropical America; occasionally planted in Guatemala, especially in the North Coast, also along the Pacific bocacosta.

A small or medium-sized tree with broad crown, the branchlets puberulent or glabrate; leaves long-petiolate, rather thick and firm, 9-11-nerved, mostly 9-13 cm. long, subcordate or truncate at the base, shallowly bilobate, the lobes rounded or very obtuse, glabrous above, sparsely pubescent beneath, at least along the nerves; racemes corymbiform, few-flowered, fragrant; calyx narrow in bud, large, densely pubescent, spathaceous in anthesis; petals rose-purple to white, about 5 cm. long and 2 cm. wide, oblanceolate or obovate; fertile stamens 3-4, very long; legume about 30 cm. long.

The tree is a handsome one, much planted in Florida, with flowers in varying shades of pink and purple that may be produced at almost any season. A good-sized tree is in the park about the railroad station at Escuintla.

***Bauhinia rubelcruziana* Donn. Smith, Bot. Gaz. 13: 27. 1888.
Casperea rubelcruziana Britt. & Rose, N. Amer. Fl. 23: 214. 1930.
B. emarginella Standl. Carnegie Inst. Wash. Publ. 461: 60. 1935.**

Wet hill forest, about 750 meters; Petén (type of *B. emarginella* from Camp 32, Guatemala-British Honduras boundary, W. A. Schipp S630); Alta Verapaz (type from Río Rubelcruz, *Tuerckheim* 896). British Honduras; Chiapas.

A shrub or tree, sometimes 9 meters high with a trunk 10 cm. in diameter, the slender branchlets brownish-tomentulose; stipules 4 mm. long, linear, caducous; leaves slender-petiolate, thin, 8-15 cm. long, 8-11 cm. wide, shallowly cordate at the base, 9-nerved, emarginate at the apex or entire and obtuse, glabrous above

or nearly so, brownish-tomentose beneath at first, in age sparsely pilose, the lobes rounded; racemes densely tomentulose, 15–20-flowered, the slender pedicels 1–2.5 cm. long; calyx 1.5–2 cm. long, tomentulose, linear-oblong in bud, becoming spathaceous; petals linear-lanceolate or narrowly spatulate, unguiculate, 2 cm. long, brick-red, ciliate; perfect stamen 1, equaling the petals; filaments rose-red; legume 10–15 cm. long, 1.5–2 cm. wide, long-stipitate, puberulent or glabrate, the valves rather thin, elastic.

Through some error, the specific name appeared originally as *rubeleruziana*.

Bauhinia Seleriana Harms, Bull. Herb. Boiss. 7: 549. 1899. *Namnamté, Pata de javalí, Pata de venado* (Huehuetenango).

Dry thickets or forest, 800–1,600 meters, endemic; Huehuetenango (type from Quen Santo, on limestone, C. & E. Seler 2797); Zacapa(?).

A shrub or tree 2–9 meters high, unarmed, the branchlets densely tomentose at first, becoming glabrate; leaves petiolate, chartaceous, 4–7 cm. long, 9–11-nerved, bilobate about one-third their length, the lobes rounded or very obtuse, glabrous above, laxly tomentose beneath; racemes tomentose, with several or numerous flowers, 3–8 cm. long, the pedicels 4–5 mm. long; buds 10–11 mm. long, the calyx densely puberulent, spathaceous; petals white, oblanceolate, short-unguiculate, 11–13 mm. long; stamens 10, the alternate ones shorter; ovary puberulent.

Bauhinia sericella Standl. Carnegie Inst. Wash. Publ. 461: 60. 1935. *Calzoncillo*.

Wet forest or thickets, sometimes in *Manicaria* swamps, at or near sea level; Izabal. British Honduras, the type from Jacinto Creek, W. A. Schipp 1197.

A small or large vine as much as 15 meters long, usually with numerous tendrils, the branchlets minutely strigillose; leaves long-petiolate, 2-foliolate, the leaflets semiovate, 5–15 cm. long or larger, acute to long-acuminate, 4-nerved, glabrous above and lustrous, brownish beneath and very densely sericeous; flowers ochroleucous, the racemes rather few-flowered or sometimes many-flowered, the rachis brown-sericeous, the pedicels 4–7 mm. long; calyx campanulate, densely ferruginous-sericeous, 5–6 mm. long, 10-costate, the teeth short, subulate; petals 12 mm. long, densely brown-sericeous outside, long-unguiculate; perfect stamens 10, short; legume about 6.5 cm. long and 17 mm. wide near the apex, acute at the base and short-stipitate, rostrate, densely and minutely brown-sericeous, the valves elastic.

Bauhinia unguolata L. Sp. Pl. 374. 1753. *Pauletia inermis* Cav. Icon. 5: 6. pl. 409. 1799. *B. inermis* Pers. Syn. Pl. 1: 455. 1805. *B. Cavanillei* Millsp. Field Mus. Bot. 1: 364. 1898. *Pata de vaca; Pie de venado*.

Wet to dry thickets or in forest, 1,000 meters or less; Petén; Santa Rosa; Retalhuleu; Huehuetenango. Southern Mexico; British Honduras; Salvador; Costa Rica; southward to Venezuela and Bolivia.

An unarmed shrub commonly 2-4 meters high, the branchlets minutely brownish-sericeous; leaves short-petiolate, mostly 6-13 cm. long, 7-9-nerved, rounded to subcordate at the base, bilobate to about the middle, the lobes acute or long-acuminate, glabrous above or nearly so, paler beneath, gland-dotted, finely pubescent or glabrate; racemes mostly elongate and many-flowered, the pedicels 5-20 mm. long; buds narrow and elongate, 4-5 cm. long, obtuse, brownish-tomentulose and glandular; petals narrow, white, turning pink; stamens 10, red; ovary long-stipitate; legume linear, 19 cm. long or shorter, 12 mm. wide, densely and finely puberulent at first, glabrate and lustrous in age, brown, long-stipitate, usually somewhat curved, containing numerous seeds.

Called "pie de vaca" in Honduras; "calzoncillo" (Tabasco); "pie de cabro," "pata de venado" (Salvador); "chaactsulubtoc" (Yucatan, Maya). In Salvador the wood of this shrub or small tree is that most commonly used, because of its strength, for making the front and rear *arcos* of *aparejos* (packsaddles). The shrub occurs in great abundance in the dry thickets of the Pacific plains.

CAESALPINIA L.

Trees or shrubs, sometimes scandent, unarmed or aculeate, often setose; leaves bipinnate, the leaflets small and numerous or large and few, herbaceous or coriaceous; stipules large and conspicuous or minute; flowers medium-sized or rather large, usually yellow or red, racemose, the racemes axillary or terminal and paniculate, the bracts small or large, usually caducous; bractlets none; calyx tube short, the 5 lobes imbricate, the lowest outermost in bud, concave or cymbiform; petals 5, orbicular to oblong, spreading, strongly imbricate, slightly unequal, or the uppermost one smaller; stamens 10, free, the filaments usually villous or glandular at the base, the anthers uniform, the cells longitudinally dehiscent; ovary sessile, free from the calyx, few-ovulate; style terete, filiform, the stigma terminal, truncate, concave, or minute; legume oblong to lanceolate or falcate, compressed, not winged, plane or turgid and bivalvate, often coriaceous or thickened and indehiscent; seeds transverse, ovate to orbicular or globose, the testa coriaceous; endosperm none; cotyledons flat or thick and carnose, the radicle short, straight.

Species 70 or more, in the tropics of both hemispheres. A few additional ones may occur in Central America. Britton and Rose divided the North American species into about 10 genera, some of which might have some good basis for generic segregation, but it seems more satisfactory to treat the group in the sense it was maintained by Bentham. What practical or sentimental advantage results from its division into small units, often of only a single species each, is not apparent.

Leaves and usually the branches armed with straight or recurved prickles; fruit often prickly.

Fruit unarmed; leaflets rounded or emarginate at the apex; trees. . *C. vesicaria*.

Fruit densely covered with stiff prickles; leaflets mostly acute; shrubs or woody vines.

Stipules foliaceous; bracts of the inflorescence reflexed; seeds gray. . . *C. crista*.

Stipules subulate or none; bracts erect or spreading; seeds yellow or olive.

C. Bonduc.

Leaves and branches unarmed, or the stems rarely setose below.

Fruit thick and hard or fleshy, indehiscent or tardily dehiscent, in a few species thin and dehiscent, but the calyx lobes then pectinate-dentate, never elastically dehiscent.

Leaflets linear-oblong, 2 mm. wide or narrower; fruit thick and hard, curved or coiled; calyx lobes entire. *C. coriaria*.

Leaflets ovate-oblong to orbicular, most of them more than 1 cm. wide; fruit thin, straight; lowest calyx lobe pectinate-dentate.

Legume densely velutinous-pubescent; leaflets densely velutinous-pilose beneath. *C. velutina*.

Legume glabrous, at least in age; leaflets in age glabrous or nearly so.

C. violacea.

Fruit flat, elastically dehiscent; calyx lobes entire.

Inflorescence densely stellate-tomentose. *C. eriostachys*.

Inflorescence glabrous or pubescent with simple hairs.

Leaflets black-glandular beneath. *C. Gaumeri*.

Leaflets not black-glandular.

Stamens about equaling the petals or shorter.

Leaflets densely pilose beneath; fruit not glandular. *C. Recordii*.

Leaflets glabrous beneath; fruit pubescent and with numerous short-stipitate glands. *C. yucatanensis*.

Stamens twice as long as the petals or longer.

Leaflets mostly 6-10 pairs or more; pedicels mostly much longer than the flowers. *C. pulcherrima*.

Leaflets mostly 3-5 or sometimes 6 pairs; pedicels usually shorter than the flowers.

Leaflets densely short-pilose, at least on the lower surface; calyx glabrous or obscurely and sparsely puberulent. *C. affinis*.

Leaflets glabrous.

Calyx glabrous. *C. exostemma*.

Calyx very densely puberulent or tomentulose with whitish hairs.
C. Conzattii.

Caesalpinia affinis Hemsl. Diag. Pl. Mex. 8. 1878 (type collected in Guatemala by Skinner, the locality unknown). *Poincianella affinis* Britt. & Rose, N. Amer. Fl. 23: 328. 1930. *Carcomo*; *Moco*; *Ebano*; *Carcaño* (fide Record; probably an erroneous name).

Dry brushy hillsides or dry forest, 700 meters or less; El Progreso; Zacapa; Chiquimula; Jalapa. Oaxaca; Honduras.

A shrub or small tree, unarmed, rarely as much as 12 meters high, the branchlets short-pilose or glabrate; pinnae 2-4 pairs, the leaflets 4-6 pairs, oblong to rounded-obovate, mostly 1.5-2.5 cm. long, rounded at the apex, often emarginate, usually densely velutinous-pilose on both surfaces; racemes short, dense, rather few-flowered, minutely puberulent or glabrate, the pedicels 1-1.5 cm. long, articulate near the apex; calyx minutely puberulent or almost glabrous, 12 mm. long, the lobes broad, entire, rounded at the apex; petals flame-red or orange-red to orange-yellow, obovate to suborbicular, about 1.5 cm. long; filaments twice as long as the petals, curved and declined, somewhat pilose; legume oblong, subfalcate, 6-8 cm. long, about 1.8 cm. wide, punctate and glandular-punctate.

This is a showy plant when in flower because of its large and intensely colored blossoms, the only disadvantage being that at flowering time, in middle *verano*, most of the plants are leafless. It is very common on dry hills of the lower Motagua Valley, especially in El Progreso, and sometimes is planted about dwellings for ornament.

Caesalpinia Bonduc (L.) Roxb. Hort. Beng. 32. 1814. *Guilandina Bonduc* L. Sp. Pl. 545. 1753.

Wet forest, often along stream banks, at or little above sea level; Izabal. Florida; British Honduras; West Indies; tropical Asia.

A large vine, often 15 meters long, climbing over trees, armed on the stems and leaf rachises with numerous small sharp uncinat prickles; stipules none; leaves large, the pinnae 3-6 pairs; leaflets 4-8 pairs, ovate to elliptic-ovate, 4-8 cm. long, sessile or nearly so, acute or acuminate, rounded or obtuse at the base, subcoriaceous, lustrous above, in age glabrous or nearly so; racemes dense, 30 cm. long or less, the flowers yellow, fragrant, the bracts linear-lanceolate, erect, soon deciduous; pedicels 4-8 mm. long; calyx 6 mm. long, brownish-tomentulose; petals 15 mm. long or less; fruit oval or oval-oblong, 6-12 cm. long, densely covered with long stiff straight prickles; seeds subglobose, yellow or olive, 1.5-2.5 cm. in diameter.

Caesalpinia Konzattii (Rose) Standl. Trop. Woods 37: 34. 1934. *Poinciana Konzattii* Rose, Contr. U. S. Nat. Herb. 13: 303. 1911. *Poincianella Konzattii* Britt. & Rose, N. Amer. Fl. 23: 328. 1930.

Dry thickets or open forest of the Pacific plains, 1,200 meters or less; Guatemala; Retalhuleu; doubtless also in other departments of the Pacific coast. Oaxaca; Salvador; Nicaragua; Costa Rica.

An unarmed shrub or tree, seldom more than 5 meters high, the branchlets and leaves glabrous; pinnae 3-5 pairs; leaflets 4-6 pairs, oval-oblong to broadly obovate, 1.5-2.5 cm. long, rounded at the apex, obtuse or rounded at the base, paler beneath; racemes dense, often many-flowered, densely puberulent or tomentulose, the pedicels 1-1.5 cm. long, articulate above the middle; calyx very broad, pale red, about 13 mm. long, densely puberulent, the broad lobes rounded at the

apex; petals sulphur-yellow, obovate, not glandular, twice as long as the calyx lobes; stamens long-exserted, 2.5–3 cm. long; legume elastically dehiscent, oblong, subfalcate, 5–9 cm. long, 2–2.5 cm. wide, velutinous-puberulent, eglandular.

Known in Salvador as “camaroncillo,” “flor del mar,” and “flor mareña.” It is questionable whether this is more than a form or variety of *C. exostemma*. The differences supposed to separate the two seem to be little more than variations in density of pubescence.

Caesalpinia coriaria (Jacq.) Willd. Sp. Pl. 2: 532. 1799. *Poinciana coriaria* Jacq. Sel. Stirp. Amer. 123. 1763. *Libidibia coriaria* Schlecht. Linnaea 5: 193. 1830. *Nacascolote*; *Nacascolo*.

Dry plains and hillsides, 900 meters or less; Retalhuleu; reported from Zacapa and Jutiapa, and probably growing in other departments but not common. Western and southern Mexico; Salvador to Panama; West Indies; Colombia and Venezuela.

An unarmed tree, 10 meters high or less, usually with a broad crown and crooked branches, the branchlets puberulent or glabrous; leaves small, the petiole and rachis tomentulose, the pinnae 4–10 pairs; leaflets 12–28 pairs, linear-oblong, 4–8 mm. long, obtuse, subcordate or truncate at the base, glabrous, usually black-dotted beneath; racemes shorter than the leaves, rather few-flowered, the pedicels glabrous, 2–4 mm. long; calyx glabrous, 5 mm. long; petals white or yellowish, about equaling the sepals; fruit thick and fleshy or coriaceous, indehiscent, 3–6 cm. long, 1–2 cm. wide, twisted, very irregular in size and shape.

Called “cascalote” in Chiapas. The trunk often branches from the base, and many of the plants are mere shrubs. The bark is scaly, chocolate-brown; sapwood pale yellow; heartwood brown or black, hard, and scant. The wood is little utilized, unless as fuel, but it is reported to yield a red dye. The wood is sometimes almost black and is then used as a substitute for ebony in fashioning small articles. The principal value of the tree is in its thick, often S-shaped pods, which are an important source of dye material and tannin and are known in the foreign trade as “dividivi.” Large amounts of the pods are exported to the United States from Colombia and Venezuela, and the tree has been planted extensively in India as a source of tannin, having been introduced there early in the nineteenth century. A tree is said to produce as much as 100 pounds of pods, which contain 25–30 per cent of tannin. Both pods and bark of the tree are said to be exported from Mexico. In that country the fruit has long been used for making black ink. In Guatemala it is much used to impart a black dye to cotton textiles.

In Salvador *nacascolote* pods are utilized to color the celebrated *huacales* or *jícaras* manufactured about Izalco from *Crescentia* fruits.

First a sirup is prepared from crude sugar, fermented maize, and old nails. After a few days the sirup becomes heavily charged with iron and is called the *tinta*. The day that the coloring is to be done there is prepared also a decoction in water of crushed pods of *nacascolote*. The *huacales*, i.e., dry *Crescentia* fruits, are first roughened to remove the outer pellicle. Then they are polished and smoothed with the rough leaves of guarumo (*Cecropia*). Thus prepared, the *huacales* are dipped into the jar of *tinta*, placed in the sun to dry, and then dipped in the *nacascolote* decoction. This process is repeated for each *huacal* many times during the day, and after each treatment each *huacal* is smoothed and rubbed with the hands to give it its peculiar luster. Sometimes before the *huacales* are dipped, they are covered with designs in wax (usually beeswax), these portions of the shell being left in natural color after the dyeing process, but more commonly the often intricate designs are cut out with a sharp penknife on the *huacal* after coloring.

Caesalpinia crista L. Sp. Pl. 380. 1753. *Guilandina Bonducella* L. Sp. Pl. ed. 2. 545. 1762.

We have seen no specimens of this from Guatemala, but undoubtedly it occurs on the Pacific seashores and possibly also along the North Coast. Florida; Mexico to Panama; West Indies; southward to Brazil; Old World tropics.

Plants usually growing along sea beaches and often forming dense thickets just beyond reach of the waves, erect and densely branched or often more or less scandent, the branches and leaf rachises armed with numerous stout sharp short prickles, the branches often also setose; stipules usually large and foliaceous, sometimes 5 cm. wide; leaves large, more or less pubescent, the pinnae 4-8 pairs; leaflets 4-8 pairs, oblong to elliptic, rather thin, 2.5-7 cm. long, obtuse to short-acuminate, often mucronate, rounded or subcordate at the base; racemes tomentulose, many-flowered, spire-like, 30 cm. long or shorter, the bracts linear-attenuate, reflexed or spreading, 1-1.5 cm. long, deciduous, the pedicels 1 cm. long or shorter; calyx tomentulose, 7-9 mm. long; petals yellow, 1 cm. long, oblong-ovate; fruit oval, 5-10 cm. long, 6 cm. wide, very densely covered with long, rather flexible, sharp prickles; seeds subglobose, gray, lustrous, 2-2.5 cm. long.

Called "taray" and "cojón de gato" in Yucatan; seeds called "avellanas" in Salvador. It is perhaps this shrub that has given the name Avellana to the port in Santa Rosa. The species is a characteristic strand shrub of many parts of the Central American coasts, where it often grows in great abundance, forming exceedingly dense and quite impassable thickets. The hard seeds, like those of *C. Bonduc*, belong to the group of so-called "sea beans," which often

are carried to European shores and other remote regions by ocean currents.

Caesalpinia eriostachys Benth. Bot. Voy. Sulph. 88. 1844.

Occasional on brushy hillsides or in open forest, 300 meters or less; Escuintla; doubtless in other parts of the Pacific plains. Western and southern Mexico; Salvador to Panama; Cuba.

A large shrub or a tree, unarmed, sometimes 15 meters high, stellate-pubescent on the branchlets, leaves, and inflorescence, often densely so; pinnae 5-8 pairs, the leaflets 7-12 pairs, suborbicular to rhombic-oblong, 5-15 mm. long, very obtuse, oblique at the base, black-dotted beneath, glabrate in age; racemes elongate, often many-flowered, the rachis and pedicels densely stellate-tomentose, the pedicels 6-15 mm. long; calyx 10-15 mm. long, stellate-tomentose; petals golden yellow, 1.5 cm. long; filaments about equaling the petals, pilose and glandular; legume coriaceous, elastically dehiscent, 10-12 cm. long, 2 cm. wide, glabrous, eglandular, often somewhat falcate.

Called "pintadillo" and "iguano" in Salvador. The very showy flowers are produced when the trees are leafless. The seeds are reported locally to cause paralysis in animals that eat them.

Caesalpinia exostemma DC. Prodr. 2: 483. 1825. *Poincianella exostemma* Britt. & Rose, N. Amer. Fl. 23: 328. 1930.

Reported by Britton and Rose (loc. cit.) from Guatemala, but we have seen no specimens. Southern Mexico.

A shrub or tree, glabrous throughout; pinnae 3-4 pairs, the leaflets 3-4 pairs, ovate, about 1.5 cm. long, obtuse; racemes about 15-flowered, the pedicels 1 cm. long, articulate near the apex; calyx reddish, glabrous, the lobes ovate-elliptic, 7 mm. long; petals somewhat longer than the calyx, suborbicular; filaments purple-red, declinate, 2.5 cm. long, twice as long as the petals, pilose, eglandular; legume 8-12 cm. long, 1.5-2 cm. wide, puberulent.

Caesalpinia Gaumeri Greenm. Field Mus. Bot. 2: 330. 1912.

British Honduras, in low, sometimes swampy forest, little above sea level; Yucatan.

A tree, sometimes 20 meters high, unarmed, the branchlets glabrous; stipules obovate, 4-8 mm. long, caducous; petioles and leaf rachis glabrous or puberulent, the pinnae 4-9; leaflets 5-9 in each pinna, opposite or alternate, rhombic-oblong to rhombic-obovate, 1-3 cm. long, rounded at the apex, oblique at the base, reticulate-veined and usually lustrous above, glabrous, or pubescent beneath on the veins, black-dotted beneath, the costa excentric; racemes 10-15 cm. long, glabrous or puberulent, the pedicels slender, 8-14 mm. long, articulate above the middle; calyx lobes oblong, 5-8 mm. long, gland-dotted; petals unguiculate, yellow, glandular, 10-12 mm. long; stamens about equaling the petals, the filaments pilose and glandular; legume linear-oblong, 8 cm. long, 2 cm. wide, acuminate, glabrous, eglandular.

Called "peccary wood," "warree wood," and "bastard logwood" in British Honduras; "citamche" (Yucatan, Maya).

Caesalpinia pulcherrima (L.) Swartz, Obs. Bot. 166. 1791. *Poinciana pulcherrima* L. Sp. Pl. 380. 1753. *Hojasén*; *Gallitos*; *Vainillo*; *Barbona*; *Flor barbona*; *Flor de Santa Lucía* (Zacapa); *Utsuh* (Quecchí); *Cabello de ángel* (Petén); *Zinkin* (Petén, Maya); *Guacamaya*; *Hierba del espanto*, *Espanta-lobos* (fide Tejada); *Santa Rosa* (Zacapa); *Flor de chapa*; *Barba del sol* (Retalhuleu).

Common in many regions in thickets and hedges, where apparently naturalized from cultivation; generally cultivated for ornament; apparently wild on dry plains and hillsides of the lower Motagua Valley, at least in the dry regions, found mostly at 900 meters or less; Petén; Alta Verapaz (cultivated); Baja Verapaz; El Progreso; Izabal; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Suchitepéquez; Retalhuleu. Mexico; British Honduras to Salvador and Panama; West Indies; South America; naturalized in the Old World tropics.

A glabrous shrub or small tree, 5 meters high or less, with brittle branches, the older branches sometimes setose; leaves large, the pinnae 3-9 pairs; leaflets 6-12 pairs, thin, short-petiolulate, paler beneath, oblong or oblong-obovate, 1-2 cm. long, 7-10 mm. wide, rounded at the apex, obtuse at the base; racemes large and elongate, terminal and axillary, the slender pedicels 5-8 cm. long; lowest calyx lobe narrow, cucullate, 1.5 cm. long, much longer than the other lobes; petals fire-red or bright yellow, 1.5-2.5 cm. long; stamens 5-6 cm. long; legume elastically dehiscent, as much as 12 cm. long, 1.5-2 cm. wide, somewhat oblique, glabrous.

Called "flambeau flower" in British Honduras; "cansic" (British Honduras, Maya); "chazinkin," "canzinkin" (Yucatan, Maya; the red and yellow forms respectively); "maravilla" (Oaxaca). This is one of the very common ornamental shrubs of the Central American lowlands, sometimes seen at middle elevations. Presumably it is a native of Mexico and Central America, but it is somewhat difficult to decide whether it ever is found in a truly wild state. If it so occurs anywhere in Central America it is in the lower Motagua Valley, especially about Zacapa and farther up the Motagua, where it grows in great abundance on the dry hillsides in a possibly wild state. Along the Pacific lowlands the shrub evidently is an escape from cultivation, although often in considerable abundance. About Zacapa in early October the shrub presents a beautiful sight, often a continuous thicket of great extent, covered with a mass of flame-colored flowers. Bright red is the prevailing color, but yellow

flowers are not uncommon, especially on cultivated plants. English names for the shrub are "bird-of-paradise" flower, "Barbados pride," and "flower fence." The flowers are somewhat fragrant and are reported to yield a good quality of honey. The fruit contains tannin and is said to be employed sometimes for tanning hides. It has been reported that in Guatemala the crushed leaves sometimes are thrown in water to stupefy fish.

Caesalpinia Recordii Britt. & Rose in Standl. Trop. Woods 7: 6. 1926. *Poincianella Recordii* Britt. & Rose, N. Amer. Fl. 23: 329. 1930.

British Honduras, at or little above sea level; type collected by S. J. Record, the locality not specified.

A medium-sized tree, the trunk as much as 25 cm. in diameter, unarmed, the branchlets, petioles, and inflorescence short-pilose or puberulent; pinnae 2-5 pairs, the leaflets 2-6 pairs, oblong or oblong-oval, mostly 2.5-4 cm. long, sparsely short-pilose above or glabrate, usually lustrous, densely velutinous-pilose beneath, subcoriaceous, eglandular; racemes 15-35 cm. long, many-flowered, the bracts ovate, 4-6 mm. long, caducous, the pedicels 1.5-2 cm. long, articulate near the middle, velutinous-pubescent; calyx 1 cm. long, densely short-pilose, the lobes broad, rounded at the apex; petals yellow, 1 cm. long, the outer ones covered on the outer surface with sessile glands; stamens about equaling the petals, the filaments villous below; legume 6-10 cm. long, 2-2.5 cm. wide, densely and finely pubescent, eglandular, subfalcate.

The Maya name is reported from British Honduras as "canlo," and English names used there are "warree wood," "peccary wood," and "bastard Billy Webb." Britton and Rose describe the pods as having both margins outcurved, which is an error, since they are somewhat falcate and in shape exactly like those of related species. Because of this misstatement, material of this species could never be traced to its proper place in their key to the species of *Poincianella*.

Caesalpinia velutina (Britt. & Rose) Standl. Trop. Woods 34: 40. 1933. *Brasilettia velutina* Britt. & Rose, N. Amer. Fl. 23: 322. 1930. *Chaperno blanco*, Totoposte (Huehuetenango); *Aripin*.

Dry, rocky, brushy or thinly forested hillsides, 250-1,000 meters; Zacapa; Chiquimula; El Progreso (type from El Rancho, W. A. Kellerman 7044); Huehuetenango. Oaxaca.

A tree 5-10 meters high, with a broad crown, the branchlets and leaf rachises densely and shortly velutinous-pilose; leaves often very large, the pinnae 2-4 pairs; leaflets 5-7 pairs, oblong or oblong-ovate, mostly 3-6 cm. long, obtuse, rounded and often oblique at the base, densely velutinous-pilose, especially beneath, paler beneath; racemes shorter than the leaves, many-flowered, brownish-

tomentulose, the pedicels 5–10 mm. long; calyx 5 mm. long, tomentulose, the outer lobe pectinate-dentate; petals yellow, 8 mm. long; legume oblong, 10–15 cm. long, 2.5–3 cm. wide, obtuse, acute or obtuse at the base and long-stipitate, densely velutinous-pubescent, brownish, the valves thin, not elastic.

The wood is used in Guatemala for construction purposes. The tree is common in dry regions of the lower Motagua Valley, conspicuous at the end of the rainy season because of its great clusters of large pods that hang for a long time on the tree.

Caesalpinia vesicaria L. Sp. Pl. 381. 1753. *Nicarago vesicaria* Britt. & Rose, N. Amer. Fl. 23: 319. 1930. *Espino negro*.

Dry thickets or dry open forest, 1,400 meters or less; Petén; Guatemala; Retalhuleu. Campeche; Yucatan; Greater Antilles.

A tree of 9 meters or less, the branchlets and leaves glabrous, the leaves usually armed with a few short stout prickles, large, the pinnae 2–3 pairs; leaflets 1–3 pairs, rounded-obovate to oblong, subcoriaceous, rounded or emarginate at the apex, rounded or obtuse at the base and often oblique, 1–4 cm. long, deep green and lustrous above, paler and dull beneath; racemes simple or branched, stout, glabrous or nearly so, the pedicels 6–9 mm. long; calyx 8–9 mm. long, glabrous, the lobes entire; petals yellow, slightly longer than the calyx lobes; stamens equaling the petals, the filaments villous; legume narrowly oblong, 4–8 cm. long, 1.2–2 cm. wide, indehiscent, puberulent at first, becoming glabrate; seeds about 6, orbicular, lustrous, brown, scarcely compressed.

Maya names of Yucatan are recorded as “toxob” and “yaxkix-canab.” An infusion of the pods with iron sulphate is said to give a permanent black dye. In Yucatan powdered charcoal of the bark is a domestic remedy for diarrhea in children.

Caesalpinia violacea (Mill.) Standl. Carnegie Inst. Wash. Publ. 461: 61. 1935. *Robinia violacea* Mill. Gard. Dict. ed. 8. No. 8. 1768. *C. brasiliensis* Swartz, Obs. Bot. 166. 1791, not L. 1753. *Cante*.

In climax forest, 300 meters or less; Petén (Uaxactún). British Honduras; Yucatan; Jamaica; Cuba.

An unarmed tree, sometimes 25 meters high with a trunk more than a meter in diameter, the branchlets and leaf rachis puberulent or glabrate; pinnae 2–4 pairs, elliptic to oblong or ovate, 2–5 cm. long, lustrous above, glabrous or puberulent, glabrous or pubescent beneath, obtuse or acute; racemes 10–25 cm. long, many-flowered, the rachis sparsely puberulent or glabrate, the pedicels 8 mm. long or shorter; calyx 8 mm. long or less, yellowish-puberulent, the outermost lobe deeply pectinate-dentate; petals yellow, 7 mm. long; stamens shorter than the petals; legume linear-oblong, 6–10 cm. long, 2.5–3 cm. wide, glabrous or nearly so, rounded at the apex, short-stipitate, the valves thin, not elastic.

"Brasiletto" (British Honduras); "chacte" (Yucatan, Maya). This has been reported from the Yucatan region as *C. platyloba* Wats., a species of northwestern Mexico. The wood gives a red dye. It is said that this pigment is the one used by the ancient Mayas for imprinting the celebrated "red hand" found on the interior walls of some of the ancient ruined buildings.

Caesalpinia yucatanensis Greenm. Field Mus. Bot. 2: 252. 1907. *Poincianella yucatanensis* Britt. & Rose, N. Amer. Fl. 23: 330. 1930. *Palo de gusano*; *Cinim* (Maya).

Moist forest, 300 meters or less; Petén. British Honduras; Yucatan.

A shrub or small tree, the trunk sometimes 15 cm. in diameter, unarmed, the young branchlets puberulent; pinnae 4-7, the leaflets 2-4 pairs, oblong to oval, 2-3.5 cm. long, rounded at the apex, rounded or obtuse at the base, glabrous, lustrous above, somewhat paler beneath; racemes 5-15 cm. long, short-pilose or puberulent, the pedicels 1.5-2 cm. long, geniculate near the apex; calyx 8 mm. long, the lobes broad, densely velutinous-pubescent; petals 1.5 cm. long, yellow, oblong to obovate, glandular below; stamens about equaling the petals; legume linear-oblong, somewhat falcate, sessile, 6-12 cm. long, 2-2.5 cm. wide, finely pubescent and reddish-glandular, the valves elastic.

Called "sen de país" in Yucatan, and the Maya name is recorded as "canpocolcum."

CASSIA L.

Trees, shrubs, or herbs, sometimes scandent; leaves even-pinnate, the petioles often glanduliferous; flowers commonly yellow, rarely white or pink, in axillary or terminal racemes, in terminal panicles, or solitary in the leaf axils; calyx tube short, the 5 segments imbricate; petals 5, imbricate, spreading, subequal or the lower ones smaller, the uppermost petal within the others; stamens 10, subequal, perfect, or the upper ones smaller, or the 3 uppermost minute and abortive, sometimes 5; anthers uniform or those of the lower stamens larger, the cells opening by an apical pore or slit; ovary sessile or stipitate, free from the calyx, often arcuate, with few or numerous ovules; style short or elongate, the stigma terminal, truncate or small; legume variable, terete to compressed and flat, woody, coriaceous, or membranaceous, indehiscent or 2-valvate, rarely with longitudinal wings, naked within or septate between the seeds, often filled with pulp; seeds transverse or sometimes longitudinal, more or less compressed, with endosperm; cotyledons ovate to oblong, the radicle short, straight.

Species 450 or more, most plentiful in tropical regions. Others besides the following are known from southern Central America. Britton and Rose referred the North American species to 28 genera, but most authors have been content to place all in a single genus, which most botanists have been able to visualize as constituting a

definite group. The legume does vary exceedingly in different groups of the genus, and it would be possible to recognize a few of the groups as distinct, especially the subgenus *Chamaecrista*. Until botanists, for lack of something better to do, agree in the recognition of numerous small generic unities, as has often been done in studies of the European flora, it seems more satisfactory to leave all plants of this alliance in the genus *Cassia*, the largest group of Leguminosae found in Central America.

Legume elastically dehiscent; herbs or low shrubs.

Petals subequal; legume oblong or oblong-linear; leaves without glands. Subgenus *Grimaldia*.

Stamens 5-7; petals 5-7 mm. long; plants annual *C. Absus*.

Stamens 9-10; petals usually more than 1 cm. long; plants perennial.

Leaflets glabrous *C. hispidula*.

Leaflets pilose or setulose, at least beneath.

Sepals glabrous or slightly pubescent; an erect shrub or small tree.

C. Deamii.

Sepals long-pilose or glandular-pilose; low herbs, often procumbent.

Flower buds pointed; sepals acute *C. Rosei*.

Flower buds rounded at the apex; sepals very obtuse *C. Killipii*.

Petals unequal; legume usually linear; petiole usually bearing a conspicuous gland. Subgenus *Chamaecrista*.

Leaflets only 1-3 pairs.

Leaflets 1 pair *C. diphylla*.

Leaflets 2-3 pairs.

Legume with appressed hairs; leaflets 5-10 mm. long *C. Tagera*.

Legume with long spreading hairs; leaflets mostly 15-20 mm. long.

C. Bartlettii.

Leaflets 5-many pairs in all or most of the leaves.

Peduncles filiform, much longer than the leaves; leaflets 4-9 pairs.

Stems densely pilose with long spreading hairs *C. pilosa*.

Stems usually incurved-puberulent *C. serpens*.

Peduncles short or elongate, scarcely filiform; leaflets usually numerous.

Stipules large, cordate-ovate; stems zigzag or flexuous *C. flexuosa*.

Stipules small, usually very narrow, not cordate; stems not conspicuously zigzag or flexuous.

Gland of the petiole sessile and depressed *C. simplex*.

Gland of the petiole conspicuously stipitate, or at least elevated and constricted at the base.

Flowers large, 2-3 cm. broad *C. Seleri*.

Flowers mostly small and 1.5 cm. broad or smaller.

Gland of the petiole borne on a rather long, slender stipe.

Legume densely pilose with rather long, spreading hairs.

C. stenocarpa.

Legume sparsely pilose with short appressed hairs *C. Wilsonii*.

Gland of the petiole almost sessile, or the stipe very short and thick.

Leaflets copiously pilose beneath with long, more or less appressed hairs. *C. mayana*.

Leaflets glabrous beneath or essentially so. . . . *C. stenocarpoides*.

Legume not elastically dehiscent; trees, shrubs, or herbs.

Legume terete, subterete, turgid, or tetragonal, not winged.

Leaflets always 2 pairs, large and broad; branches never hirsute; large shrubs or sometimes woody vines.

Bracts foliaceous, persistent; petals greenish yellow; leaflets minutely and inconspicuously sericeous beneath. *C. undulata*.

Bracts caducous; petals buff or yellow, not greenish. *C. bacillaris*.

Leaflets more than 2 pairs in all or most of the leaves, often very numerous or, if only 2 pairs, the plants herbaceous and with long-hirsute stems.

Leaves eglandular; trees.

Leaflets glabrous; flowers yellow. *C. fistula*.

Leaflets sparsely or densely pubescent.

Leaflets rounded or very obtuse at the apex; flowers pink or white.
C. grandis.

Leaflets acute or acuminate; flowers yellow. *C. spectabilis*.

Leaves with glands between the leaflets; herbs or shrubs.

Leaflets 2 pairs; stems densely long-hirsute. *C. pilifera*.

Leaflets more than 2 pairs in all or most of the leaves, often numerous pairs; stems not hirsute.

Leaflets acute or acuminate; plants glabrous throughout. . . *C. laevigata*.

Leaflets rounded or obtuse at the apex, usually more or less pubescent, sometimes glabrous.

Legume about 3 mm. thick, tetragonal, dehiscent along both sutures; plants herbaceous, the stems usually glabrous. *C. Tora*.

Legume much thicker, indehiscent or irregularly rupturing; plants shrubs, the branches usually densely pubescent.

Leaflets 6-8 pairs; fruit densely pubescent. *C. tomentosa*.

Leaflets mostly 3-5 pairs; fruit glabrous.

Leaflets glabrous; anthers all short-rostrate. . . *C. bicapsularis*.

Leaflets pilose beneath; 3 of the anthers long-rostrate.

C. indecora.

Legume compressed and flat, or sometimes 4-winged.

Legume conspicuously 4-winged.

Plants herbaceous, a meter high or less; leaflets 3 pairs. . . . *C. pentagonia*.

Plants tall shrubs or small trees; leaflets numerous pairs. *C. alata*.

Legume not winged.

Leaves with a gland at the base of the petiole; herbs; leaflets acute or acuminate.

Legume glabrous or puberulent, 6-9 mm. wide, 6-12 cm. long; plants glabrous throughout or nearly so, or only puberulent. . . *C. occidentalis*.

Legume densely pilose with spreading hairs, 8-30 cm. long; plants abundantly pilose. *C. leptocarpa*.

Leaves eglandular, or the glands not at the base of the petiole.

Leaves bearing glands between some or all the leaflets.

Leaflets 3 pairs; plants herbaceous or suffrutescent; legume arcuate.

Leaflets rounded or obtuse at the apex; stems pubescent or glabrate.
C. leiophylla.

Leaflets acute; branches hirsute. *C. cobanensis.*

Leaflets 4—many pairs in all or most of the leaves.

Plants annual herbs; legume transversely impressed between the seeds..... *C. uniflora.*

Plants shrubs or trees; legume not impressed between the seeds.

Legume articulate between the seeds; petals 4 cm. long; leaflets broadly obovate..... *C. Skinneri.*

Legume not articulate, the valves continuous; petals usually smaller.

Flowers small, about 8 mm. long, in short many-flowered dense racemes on much elongate peduncles..... *C. guatemalensis.*

Flowers larger, commonly 2 cm. long, in short-pedunculate cymes or short few-flowered racemes.

Leaflets mostly 15–30 pairs, linear-oblong, sessile or nearly so..... *C. foliolosa.*

Leaflets mostly 3–10 pairs, oblong or oval to obovate, petiolulate.

Leaflets glabrous beneath or nearly so; legume 5–6 mm. wide.

Leaflets 4–10 pairs..... *C. biflora.*

Leaflets 2–3 pairs..... *C. Holwayana.*

Leaflets copiously pilose or sericeous beneath.

Leaflets densely sericeous beneath, mostly oblong; legume 5–6 mm. wide..... *C. longirostrata.*

Leaflets loosely pilose beneath, mostly obovate; legume 3.5–4 mm. wide..... *C. xiphoidea.*

Leaves eglandular.

Leaflets 2–5 pairs.

Branches unarmed.

Inflorescence short-racemose or subcorymbose, few-several-flowered; leaflets obtuse or rounded at the apex.

C. emarginata.

Inflorescence long-racemose, many-flowered; leaflets acute or acuminate..... *C. xanthophylla.*

Branches usually armed with stipular spines.

Leaflets oblong-elliptic, obtuse or rounded at the apex. . . *C. petensis.*

Leaflets lanceolate, acuminate. *C. anisopetala.*

Leaflets many pairs.

Leaflets glabrous or practically so.

Petals with conspicuous dark veins; leaflets aristate-mucronate.
C. nicaraguensis.

Petals not conspicuously veined; leaflets not mucronate or very obscurely so..... *C. siamea.*

Leaflets copiously pubescent beneath.

- Leaflets broadly rounded or emarginate at the apex, not or very obscurely mucronate. *C. reticulata*.
 Leaflets obtuse or subacute, aristate-mucronate. *C. didymobotrya*.

Cassia Absus L. Sp. Pl. 376. 1753. *Grimaldia Absus* Britt. & Rose, N. Amer. Fl. 23: 299. 1930. *Moquillo*.

Grassy slopes, 400–525 meters; Chiquimula (near Sasmó, north-west of Chiquimula, *Steyermark* 30189); Santa Rosa; Escuintla. Southern Mexico; West Indies; South America; Old World tropics.

Plants annual, erect, or sometimes more or less clambering, 75 cm. high or less, sparsely branched, the stems densely viscid-pilose with long and short hairs; stipules small, lanceolate; leaves slender-petiolate, the petiole eglandular; leaflets 4, elliptic to rounded-obovate, 2–3 cm. long, obtuse or rounded at the apex, glabrous above, paler beneath and puberulent or appressed-pilosulous; flowers short-pedicellate, yellow, small, the petals 5–7 mm. long; stamens usually 5, sometimes 7; legume broadly linear, 2.5–4.5 cm. long, 4–6 mm. wide, compressed, elastically 2-valvate, thinly setulose-pilose with very long, spreading hairs.

Cassia alata L. Sp. Pl. 378. 1753. *Herpetica alata* Raf. Sylva Tell. 123. 1838. *Barajo*; *Moco*.

Moist or wet thickets, at or little above sea level; Izabal, and probably also in other lowland regions. Southern Mexico; British Honduras to Panama; West Indies; South America; Old World tropics.

Usually a shrub of 1–2 meters but sometimes larger, the branches stout, puberulent or glabrate; stipules lanceolate, attenuate, 1–2 cm. long; leaves large, eglandular; leaflets 6–12 pairs, membranaceous, broadly oblong or oblong-obovate, 5–15 cm. long, 3–8 cm. wide, broadly rounded at the apex and base, sparsely puberulent or glabrate; flowers yellow, in terminal or axillary racemes, these usually as long as the leaves or longer and many-flowered, the pedicels short; bracts ovate-orbicular, obtuse, 1–1.5 cm. long, caducous; sepals 1 cm. long; petals unguiculate, 2 cm. long or less, conspicuously veined; stamens 10, 7 of them perfect, the others reduced to staminodia; legume linear, chartaceous, straight, 10–15 cm. long, 1.5 cm. broad, lustrous, longitudinally dehiscent, with 4 broad thin longitudinal wings; seeds very numerous, transverse, compressed, brown, 5 mm. long.

Called “taratana” in Tabasco; “flor del secreto” (Yucatan). The English name “ringworm shrub” is sometimes given to the plant, an ointment prepared from the leaves being a popular remedy in tropical America for ringworm and other cutaneous diseases. This species seems to be rare in most regions of Central America. In general appearance it is exactly like *C. reticulata*, but the pods of the two species are, of course, very unlike.

Cassia anisopetala Donn. Smith, Bot. Gaz. 37: 209. 1904. *Pseudocassia anisopetala* Britt. & Rose, N. Amer. Fl. 23: 231. 1930.

Wet thickets, 350 meters; Alta Verapaz, the type from Cubilgüitz, *Tuerckheim* 8194.

A shrub, the branches armed with short stout stipular spines, densely pubescent; leaves eglandular; leaflets 4 or sometimes 2-3 pairs, lanceolate, 3-8 cm. long, 1-3 cm. wide, acuminate, cuneate at the base, glabrous and lustrous above, pubescent beneath; flowers racemose, the racemes 4-20 cm. long, many-flowered, the pedicels 5-6 mm. long; sepals oval or oblong, 5-9 mm. long; petals very unequal, the largest 2 cm. long; perfect stamens 7, the anthers pilose; staminodia 3; ovary glabrous.

We have seen no material of this species, but from description it is close to *C. petensis*. Why Britton and Rose did not make another new genus of these two species is hard to understand, for they certainly have little resemblance to *C. spectabilis*, type of their genus *Pseudocassia*, and do have better characters for segregation than many of their other genera.

Cassia bacillaris L. f. Suppl. Pl. 231. 1781. *Chamaefistula bacillaris* G. Don, Gen. Syst. 2: 451. 1832. *Cassia fagifolia* Bertol. Fl. Guat. 414. 1840 (type from "Mar del Sur," Guatemala, *Velásquez*). *Chamaefistula fagifolia* Britt. & Rose, N. Amer. Fl. 23: 235. 1930. *Moco*; *Frijol de cabro*.

Wet or moist thickets, often in second growth, frequently along rocky stream banks, 1,000 meters or less; Petén; Alta Verapaz; Izabal; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Sacatepéquez; Suchitepéquez; Retalhuleu; probably in all the Pacific coast departments. Southern Mexico; British Honduras to Panama; West Indies; South America.

A shrub of 5 meters or less, sparsely branched, usually rather weak and sometimes subscandent, the young branches generally puberulent, often glabrate; stipules linear, caducous; leaf rachis bearing an oblong gland between the lower leaflets; leaflets 4, membranaceous or thicker, usually broadly elliptic, sometimes obovate, asymmetric, acute or short-acuminate, mostly 7-15 cm. long, glabrous above or nearly so, pale beneath, sparsely or densely puberulent or pilosulous; flowers buff, in short dense few-flowered racemes, these forming small or large panicles at the ends of the usually flexuous or zigzag branches; sepals oval, rounded at the apex, thin, 7-11 mm. long, appressed-pilosulous; petals about 2 cm. long, thinly sericeous; perfect stamens 7; ovary densely appressed-pilose; legume subterete, 10-25 cm. long, glabrous, 10-14 mm. thick, short-stipitate, many-seeded, dehiscent along the lower suture or often rupturing irregularly, the interior with abundant pulp.

A rather showy shrub, often abundant in second growth in wet regions. Britton and Rose published from Central America numerous segregates of the species, most of them of very doubtful validity, none of which need be cited here. This and related species are often

infested with savage ants that gather in the inflorescences, apparently to feed upon a viscid exudate from the branches. This species has been reported from Guatemala as *C. oxyphylla* Kunth.

Cassia Bartlettii Standl. Field Mus. Bot. 11: 132. 1932.

British Honduras, open places, often in pine ridge, at or little above sea level; type from El Cayo District, *H. H. Bartlett* 11649.

Plants erect, shrubby or at least suffrutescent, strict, 1.5 meters high or less, much branched, the stems sparsely or densely pilose with spreading hairs, often almost hidden by the stipules; stipules ovate-oblong, persistent, 10–14 mm. long, acute, shallowly cordate at the base, multistriate, long-ciliate; leaves very numerous, small, the petiole bearing a small depressed gland near the apex; leaflets 4, cuneate-oblong or obovate-oblong, 1–2 cm. long, 5–7 mm. wide, somewhat oblique, rounded at the apex, glabrous, ciliate, 4–5-nerved, often pale or glaucescent beneath; peduncles axillary, 1-flowered, longer than the leaves; sepals glabrous, thin, multistriate, long-acuminate, 14 mm. long or less; petals yellow, 1.5 cm. long; legume oblong-linear, 4 cm. long, 7 mm. wide, compressed, elastically 2-valvate, densely fulvous-hispid, about 12-seeded.

Cassia bicapsularis L. Sp. Pl. 376. 1753. *Adipera bicapsularis* Britt. & Rose ex Britt. & Wils. Sci. Surv. Porto Rico 5: 370. 1924. *Vainillo*; *Moco*; *Moco de gallo*.

Moist thickets, sometimes in oak forest, often in second growth or in waste ground, 1,500 meters or less; Petén; Chiquimula; Jalapa; Santa Rosa; Quezaltenango; San Marcos. Mexico; British Honduras to Panama; West Indies; South America.

Plants usually more or less woody, glabrous throughout or nearly so, erect or sometimes weak and supported on other shrubs, with stems as much as 4.5 meters long; stipules small, deciduous; leaves long-petiolate, the rachis bearing an oblong gland between the leaflets of the lowest pair; leaflets 3–5 pairs, obovate, to broadly oblong or suborbicular, 1–4 cm. long, rounded at the apex, pale beneath; flowers yellow, racemose, the racemes axillary, mostly longer than the leaves, long-pedunculate, the flowers numerous, crowded near the apex of the inflorescence; bracts caducous; pedicels 3–8 mm. long; sepals oval, 8–12 mm. long, rounded at the apex; petals 1–1.5 cm. long; anthers exserted; ovary glabrous; legume short-stipitate, terete, 8–15 cm. long, 1–1.5 cm. thick, glabrous, lustrous, tardily dehiscent along one suture, the valves brittle and thin, often rupturing irregularly; seeds numerous, brown, lustrous, transverse, 5 mm. long, imbedded in abundant pulp.

Sometimes called "wild currant" or "wood creeper" in British Honduras; "alcaparrillo" (Yucatan); "cachimbo" (Tabasco); "moco de güegüecho," "caragüillo," "frijolillo," "moco de gallo," "moco de chompipe" (Salvador). The pulp of the fruit is sweet and edible, with a flavor somewhat resembling that of tamarind.

Cassia biflora L. Sp. Pl. 378. 1753. *Peirania biflora* Pittier, Arb. & Arb. Legum. 128. 1928. *Ronrón* (Volcán de Pacaya; perhaps an erroneous name); *Moco*; *Barbasco* (Huehuetenango); *Flor amarilla*; *Tzulcám* or *Tzulcán* (Huehuetenango).

Moist or dry thickets, often in second growth or waste ground, sometimes in open oak forest, 500–2,400 meters; Zacapa; Chiquimula; Jalapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Sololá; Quiché; Huehuetenango. Mexico; Honduras and Salvador to Panama; West Indies; Colombia and Venezuela.

Usually a shrub of 1–3 meters but sometimes a tree of 10 meters, or occasionally elongate and reclining on other shrubs, the branches pubescent or glabrous, usually slender; stipules subulate or setaceous, small, deciduous; petiolar gland subcylindric or clavate, inserted between the lowest leaflets; leaflets mostly 4–10 pairs, oblong to obovate, 1–3 cm. long, obtuse or rounded at the apex, petiolulate; peduncles mostly axillary, 1–3-flowered, sometimes clustered at the ends of the branches, the pedicels slender, 1–2 cm. long; sepals obtuse or rounded at the apex, 4–8 mm. long; petals bright yellow, about 2 cm. long; legume linear, 6–15 cm. long, 5–6 mm. wide, compressed, bivalvate, glabrous or pubescent.

Known in Salvador as “carne asada,” “caragüillo,” “flor barbona amarilla,” and “brasilillo”; “cacahuite,” “comayagua” (Honduras). One of the common weedy shrubs through much of Central America, especially along the Pacific slope. Britton and Rose published numerous segregates from Central America, of slight taxonomic importance, but few of their names are connected with Guatemalan material. The species is a variable one, it is true, but it appears impossible to find satisfactory characters for separating the more obvious forms, or at least they have not been found up to the present time. In Huehuetenango this plant is said to be used in conjunction with *Tephrosia* in infusion for bathing domestic animals in order to destroy insect and other parasites.

Cassia cobanensis (Britton) Lundell, Phytologia 1: 214. 1937. *Vogelocassia cobanensis* Britton in Britt. & Rose, N. Amer. Fl. 23: 259. 1930.

Type from Cobán, Alta Verapaz, *Tuerckheim* 2056; known only from the type.

Plants herbaceous, a meter high, hirsute; stipules 1–2 cm. long, persistent; rachis bearing a narrow gland between the lowest leaflets; leaflets 3 pairs, obovate or broadly oblong, 5 cm. long or shorter, acute, pubescent on both surfaces; peduncles short, 1–3-flowered, the slender pedicels 3–4 cm. long; flowers yellow, 4.5–5 cm. broad, the sepals obtuse, 1 cm. long; perfect stamens 7; legume linear, compressed, 6–9 cm. long, 4–5 mm. wide, falcate, attenuate to the base and apex; seeds brown, turgid, 3.5–4 mm. long.

We have seen no material of this species.

Cassia Deamii (Britt. & Rose) Lundell, Carnegie Inst. Wash. Publ. 478: 212. 1937. *Grimaldia Deamii* Britt. & Rose, N. Amer. Fl. 23: 300. 1930.

Dry rocky hillsides, 1,100 meters; Guatemala (type from Fiscal, C. C. Deam 6109). Chiapas; British Honduras.

A shrub of 1-2 meters or sometimes a tree of 5 meters, much branched, the slender branches pubescent and glandular, the older ones fuscous-brown; stipules minute, lanceolate; petioles very slender, 2-4 cm. long, eglandular; leaflets 4, obovate or oval, 1-2 cm. long, rounded or shallowly emarginate at the apex, green and glabrous above, pilose or glabrate and paler beneath; flowers racemose, yellow, the racemes few-flowered, lax, terminal, viscid-pilose, the pedicels 1-2.5 cm. long; flower buds globose, rounded at the apex; sepals almost glabrous, obtuse, 8-9 mm. long; petals 12-15 mm. long; legume linear-oblong, 2.5-3.5 cm. long, 5-7 mm. wide, flat, elastically 2-valvate, rather densely pilose and short-setulose, about 5-seeded.

Cassia didymobotrya Fresen. Flora 22: 53. 1839. *Moco de chiltote* (fide Aguilar).

Native of tropical Africa; planted for ornament in various parts of Guatemala, and occasionally seen half wild, perhaps about the sites of former dwellings.

A tall shrub, in habit and general appearance similar to *C. reticulata*, the branches puberulent; stipules large, green, persistent, cordate-ovate, acuminate; leaves eglandular; leaflets 7-15 pairs, broadly oblong, 2-3.5 cm. long, obtuse and aristate, pilosulous, especially beneath; flowers large, pale yellow, the racemes longer than the leaves, many-flowered, long-pedunculate, the bracts ovate, green, caducous, the flowers short-pedicellate; sepals puberulent; petals pale yellow, with conspicuous dark veins; legume linear, short-pilose, flat, bivalvate.

Resembling *C. reticulata* in appearance, this species has much paler flowers. It is grown also in Costa Rica. In Guatemala it is frequent about the capital as well as in the cemetery and gardens of Tactic and in other parts of Alta Verapaz.

Cassia diphylla L. Sp. Pl. 376. 1753. *Chamaecrista diphylla* Greene, Pittonia 4: 28. 1899.

Grassy savannas or hillsides, sometimes in pine forest or along sandy or rocky stream beds, 700 meters or less; Alta Verapaz; Izabal; Escuintla; San Marcos. Southern Mexico; British Honduras; Nicaragua; Panama; southward to Brazil; West Indies.

Plants herbaceous or suffrutescent, annual, erect or ascending, sparsely branched, glabrous or nearly so; stipules lanceolate, cordate at the base, 5-20 mm. long, striate-nerved, acuminate, longer than the petioles, appressed to the stem; petiolar glands 1-2, sessile or stipitate; leaflets 2, obliquely obovate, 1-3 cm. long, palmate-nerved, rounded at the apex, glabrous; peduncles stiff, longer than the

leaves; sepals finely many-nerved, scarious, 6-10 mm. long, obtuse and apiculate or acuminate; petals yellow, equaling the sepals; legume linear, 3-6 cm. long, 3-6 mm. wide, pilose with long spreading hairs.

Called "hierba de ciempiés" in Salvador. A typical savanna plant.

Cassia emarginata L. Sp. Pl. 376. 1753. *C. atomaria* L. Mant. Pl. 68. 1767. *C. emarginata* var. *subunijuga* Rob. & Bartl. Proc. Amer. Acad. 43: 53. 1907 (type from Gualán, Zacapa, C. C. Deam 220). *Vainillo*; *Vainillón* (fide Aguilar).

Dry, brushy or thinly forested hillsides or canyons, 180-1,400 meters; Petén; Alta Verapaz; Zacapa; Chiquimula; El Progreso; Guatemala; Huehuetenango. Mexico; British Honduras to Costa Rica; West Indies; Colombia and Venezuela.

A shrub or tree of 2-12 meters, the crown low, spreading, the trunk often branched from the base, the bark gray or brownish, the branchlets densely pilosulous or tomentose; stipules small, setaceous; leaves eglandular; leaflets 1-5 pairs, broadly oblong to suborbicular, 2-10 cm. long, rounded or obtuse at the apex, often emarginate, obtuse or rounded at the base, puberulent or glabrate above, pale beneath, densely velutinous-pilosulous or tomentose; racemes shorter than the leaves, axillary, few-flowered, the pedicels long and slender, unequal; sepals 5-7 mm. long, sparsely pubescent, rounded at the apex; petals yellow, 2-3 times as long as the petals, glabrous or sparsely pilose; perfect stamens 7; legume linear, 15-35 cm. long, 8-12 mm. wide, straight, compressed but thick, coriaceous, indehiscent, glabrous or glabrate, many-seeded.

Called "barba de jolote" in British Honduras; "arguchoco" (Salvador); "xtuab," "xtuhabin" (Yucatan, Maya). The sapwood is yellow, the heartwood dark brown and hard. The shrub is a characteristic species of the dry, thinly wooded hillsides of the lower Motagua Valley, especially in El Progreso, and it occurs in a few other regions but in less abundance. In the Gualán region it is popularly believed that if horses and mules eat the pods, the hair of their tails falls out. The foliage has a rather strong and unpleasant odor. In Yucatan it is sniffed to stop nose bleed. *C. emarginata* var. *subunijuga* is a minor form in which most of the leaves have a single pair of leaflets.

Cassia fistula L. Sp. Pl. 377. 1753. *Cañafistula*.

A native of tropical Asia, rarely cultivated as a shade tree in Guatemala, as at El Rancho. Planted frequently in some parts of tropical America, particularly in the West Indies, but infrequent in Central America.

An almost or quite glabrous tree, sometimes 20 meters high, generally with open branching; stipules linear-lanceolate, small, fugacious; leaves large, long-petiolate, the leaflets 4–8 pairs, long-petiolulate, rather thick and firm, ovate to oblong-ovate or ovate-lanceolate, 7–20 cm. long, acute or short-acuminate, obtuse at the base, glabrous, bright green and often lustrous above, slightly paler beneath; racemes slender, pendent, lax, many-flowered, 25–75 cm. long, the slender pedicels 2–5 cm. long; sepals oval or oblong, puberulent, 6–10 mm. long; petals pale yellow or bright yellow, 2–3 cm. long; legume cylindric, dark brown or blackish, commonly about 50 cm. long and 2 cm. thick, indehiscent, pulpy within about the compressed horizontal seeds.

In some regions the pulp of the fruit is much used in domestic medicine because of its laxative properties. The tree is a handsome and ornamental one, but it is rarely seen in Central America.

Cassia flexuosa L. Sp. Pl. 379. 1753. *Chamaecrista flexuosa* Greene, Pittonia 4: 27. 1899.

Open rocky slopes or moist or wet savannas, 1,000 meters or less; Petén; Jutiapa; Quiché. Southern Mexico; British Honduras; Salvador; Panama; Cuba; South America.

Plants perennial, erect from a woody root, glabrous, puberulent, or densely short-pilose, erect or ascending, the stems stiff, slender, conspicuously zigzag or flexuous, mostly 50 cm. long or less; stipules ovate-cordate, acute or acuminate, thick, striate-nerved, 5–15 mm. long; petiole bearing 1–2 sessile orbicular glands; leaflets 15–50 pairs, oblong-linear, coriaceous, glabrous or pubescent, obtuse or acute, 2–4-nerved, 4–8 mm. long; peduncles 1–2.5 cm. long; sepals membranaceous, glabrous or pubescent, acute, 8–10 mm. long; larger petals 14–17 mm. long, yellow; legume linear, 3–6 cm. long, 5 mm. wide, glabrous or finely pubescent, many-seeded.

The Maya name of Yucatan is recorded as “bualchich.”

Cassia foliolosa Benth. Trans. Linn. Soc. 27: 544. 1871 (type from some unspecified locality in Guatemala, *Skinner*).

Dry or moist thickets, sometimes at the edge of forest or in thinly wooded *barrancos*, often in rocky places, 1,100–2,400 meters; endemic; Zacapa; Chiquimula; Jalapa; Jutiapa; Guatemala; Chimaltenango.

A shrub or small tree of 1–5 meters, sparsely branched, the branches slender, puberulent on the young branchlets, elsewhere glabrous or nearly so; leaflets 20–30 pairs, linear-oblong, 8–12 mm. long, about 3 mm. wide, green above, pale beneath; petiole bearing a gland between the lowest leaflets; peduncles axillary, 2-flowered; sepals oval or suborbicular, 1 cm. long, glabrous or nearly so; petals yellow, 2 cm. long; 3 lower anthers larger than the others, rostrate; ovary appressed-pilose; legume linear, flat, about 9 cm. long and 5 mm. wide, slightly falcate, appressed-pilosulous, stipitate.

Cassia grandis L. f. Suppl. Pl. 230. 1781. *Caragua*; *Bucut*, *Bocot* (Petén, Maya, fide Lundell); *Cañafistula* (Petén); *Mucut* (Petén, Maya); *Carao*.

Open, brushy or forested hillsides or on thinly forested plains, often about dwellings or along roadsides and in pastures, 900 meters or less; Petén; Jutiapa; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu; probably in all the Pacific coast departments as well as elsewhere in the Oriente. Southern Mexico; British Honduras to Salvador and Panama; West Indies; northern South America.

A large tree, sometimes 30 meters high or more, the crown rounded or spreading, the trunk sometimes a meter in diameter, the bark chocolate-brown, scaly, the young branchlets densely pilosulous; stipules very small, linear, deciduous; leaves short-petiolate, eglandular; leaflets 8–20 pairs, oblong, short-petiolulate, 3–5 cm. long, rounded or very obtuse at each end, lustrous above, puberulent or glabrate, paler beneath and puberulent; flowers pink or white, racemose, usually appearing when the tree is leafless or nearly so, the racemes 10–20 cm. long, the flowers slender-pedicellate; sepals broad, 6–8 mm. long, rounded at the apex, whitish-tomentulose; petals 1 cm. long, glabrous; stamens 10, the anthers of the 3 lower stamens longer than the others; legume ligneous, terete, blackish, indehiscent, 30–80 cm. long, 2–2.5 cm. thick, septate within; seeds transverse, compressed.

Known in British Honduras as “stinking-toe” and “beef-feed.” The wood is brownish yellow, rather hard and heavy, coarse-textured; not durable. It is utilized for fuel and minor construction purposes. When in flower, this is one of the handsome trees of Central America, especially along the Pacific lowlands, reminding one of apple trees, by both the form of the tree and the coloring of the blossoms. The ashes of the wood are employed in soap-making. The pulp of the pods is edible but has purgative properties. An ointment made from lard and the crushed leaves is employed commonly in treating cutaneous diseases, especially mange and other skin affections in dogs. It is probably this species that has been reported from Petén as *C. moschata* HBK., a species that apparently does not extend to northern Central America.

Cassia guatemalensis Donn. Smith, Bot. Gaz. 23: 6. 1897. *Cassia Caeciliae* Harms, Bull. Herb. Boiss. 7: 549. 1899 (type from Todos Santos, Huehuetenango, C. & E. Seler 3172). *Peiranisia guatemalensis* Britt. & Rose, N. Amer. Fl. 23: 266. 1930. *Barajito*.

Exposed hillsides or in wet upland thickets, often in *Cupressus* forest, sometimes on white-sand slopes, 1,650–2,700 meters; Jalapa; Jutiapa; Santa Rosa (type from Buena Vista, Heyde & Lux 4176); Chimaltenango; Huehuetenango; Quezaltenango; San Marcos. Costa Rica.

A shrub or tree of 2.5–6 meters, sparsely branched, the branchlets stout, densely velutinous-pilose; stipules linear, 6 mm. long; leaves large, the rachis bearing a gland between the lowest leaflets; leaflets 4–8 pairs, thick, oblong, 3–5 cm. long, obtuse or rounded at the apex, appressed-pilose on the margins and on the costa beneath; flowers small, pale yellow, racemose, slender-pedicellate, numerous, mostly crowded near the end of the long peduncle; sepals suborbicular, 4–6 mm. long; petals 6–8 mm. long, with conspicuous dark veins; anthers not rostrate; legume flat, 2-valvate, straight or slightly curved, about 8 cm. long and 12 mm. wide, sparsely pilose or glabrate.

The shrub is frequent in some of the high mountain regions of central and western Guatemala, in appearance very unlike any other local species of the genus, especially because of its unusually small flowers.

Cassia hispidula Vahl, Eclog. 3: 10. 1807. *Grimaldia hispidula* Britt. & Rose, N. Amer. Fl. 23: 299. 1930. *Moco*.

Dry, open, usually rocky slopes, frequently in pine forest, 200–1,600 meters; Zacapa; Chiquimula; Quiché; Huehuetenango. Southern Mexico; Salvador; Costa Rica; Cuba; northern South America.

Plants perennial, herbaceous from a woody root, the stems often much branched, decumbent, slender, 75 cm. long or less, viscid-puberulent and setulose-pilose with long spreading hairs; petioles longer than the leaflets, slender, eglandular; leaflets 4, orbicular to elliptic, 1–2 cm. long, rounded or very obtuse at the apex, glabrous; flowers yellow, chiefly in short few-flowered terminal racemes, the pedicels long and slender; sepals green, acute, viscid-pilose, 8–10 mm. long; petals 1.5–2 cm. long; stamens 10; legume compressed and flat, elastically 2-valvate, 3–5 cm. long, 5–7 mm. wide, setulose-hirsute with very long, spreading hairs; seeds few, oblong, black, 5 mm. long.

Known in Salvador and Costa Rica (probably also in Guatemala) as “nahuapate,” and used medicinally. The name, of Nahuatl origin, is a curious one, signifying, presumably, “Mexican medicine.”

Cassia Holwayana Rose, Contr. U. S. Nat. Herb. 8: 301. 1905. *C. multiflora* Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 307. 1843, not *C. multiflora* Vog. 1837.

Dry, brushy, or moist, often rocky hillsides, 650 meters or less; Zacapa; Chiquimula. Southern Mexico.

A slender shrub 1–4 meters high, glabrous throughout; stipules linear, caducous; leaflets 2–3 pairs, rounded-obovate to broadly oblong, 2–4.5 cm. long, rounded at the apex, paler beneath; petiole with an elongate gland between the lowest leaflets; peduncles axillary, solitary or clustered, mostly 2-flowered, the slender pedicels 1.5–2 cm. long; flowers yellow, 4–5 cm. broad; sepals oval or orbicular, glabrous, sometimes ciliate, 5–9 mm. long; ovary densely appressed-pilose; legume linear, flat, 8–12 cm. long, 4 mm. wide, sparsely pubescent or almost glabrous, 2-valvate.

Cassia indecora HBK. Nov. Gen. & Sp. 6:344. 1824. *Adipera indecora* Britt. & Rose, N. Amer. Fl. 23: 239. 1930. *Moco de chompipe*.

Moist or dry, often rocky, brushy hillsides, sometimes in oak forest, 250–1,300 meters; Zacapa; Jutiapa; Santa Rosa; Guatemala. Mexico; southward to Panama; West Indies; South America.

A shrub or small tree, sometimes 5 meters high, occasionally somewhat scandent, the stems short-pilose or glabrate; petiole bearing a gland below the lowest leaflets; leaflets 3–5 pairs, rather fleshy and thick, oblong to obovate, 1.5–4.5 cm. long, rounded at the apex, glabrous above or nearly so, sparsely or densely pilose beneath; flowers deep yellow, racemose, the racemes equaling or longer than the leaves, few–many-flowered, the bracts linear, green, the pedicels 6–10 mm. long; sepals broad, 1 cm. long or shorter, rounded at the apex, sparsely pilose or almost glabrous; petals about 1.5 cm. long, glabrous; 3 of the anthers conspicuously rostrate; ovary densely pilose; legume subterete, 8–15 cm. long, 1 cm. thick, glabrate, tardily if at all dehiscent, the valves thin, fragile; seeds numerous, surrounded by pulp, transverse, compressed.

Cassia javanica L., a native of tropical Asia, is in cultivation at Finca Mocá in Sololá. It is a small or medium-sized tree, the leaves almost glabrous, with 6–12 pairs of large, glabrous, ovate to oval, very obtuse leaflets and with umbelliform inflorescences of large pink flowers. The cylindric fruits are 30–60 cm. long. The tree is apparently very rare in cultivation in tropical America.

Cassia Killipii Rose in Standl. Journ. Wash. Acad. Sci. 17: 167. 1927. *Grimaldia Killipii* Britt. & Rose, N. Amer. Fl. 23: 301. 1930.

Open savannas or in rocky places, British Honduras, at or little above sea level; Panama.

Plants perennial, prostrate, much branched, the stems a meter long or shorter, densely short-pilose and with long slender spreading viscid hairs; stipules minute; leaves slender-petiolate, the petiole eglandular; leaflets 4, orbicular to elliptic, 5–15 mm. long, rounded or very obtuse at the apex, glabrous above, pubescent beneath; flowers deep orange, solitary in the leaf axils or in few-flowered terminal racemes, the buds rounded at the apex; sepals sparsely or densely hirsute, 8–9 mm. long, rounded at the apex; petals 11–13 mm. long; stamens 10; legume about 2.5 cm. long and 5 mm. wide, densely long-hirsute.

Cassia laevigata Willd. Sp. Pl. 441. 1809. *Adipera laevigata* Britt. & Rose ex Britt. & Wils. Sci. Surv. Porto Rico 5: 371. 1924. *Frijolillo*; *Moco*.

Moist or wet thickets or hedgerows, sometimes a weed in waste ground, often in second growth, sometimes in moist forest, 2,300 meters or less; Alta Verapaz; Baja Verapaz; Izabal; Guatemala;

Chimaltenango; Suchitepéquez; Retalhuleu; San Marcos; Huehuetenango. Mexico; Salvador; Costa Rica; Greater Antilles; South America; naturalized in the Old World tropics.

A shrub or small tree, sometimes almost wholly herbaceous, 6 meters high or less, glabrous throughout; stipules linear, 5–8 mm. long, caducous; glands usually borne on the rachis between each pair of leaflets; leaflets 3–4 pairs, thin, bright green, ovate to oblong-elliptic, 3–8 cm. long, long-acuminate; racemes axillary and terminal, short and rather dense, long-pedunculate, mostly shorter than the leaves, the bracts linear-lanceolate, deciduous, the pedicels 5–15 mm. long; sepals suborbicular, rounded at the apex, 6–10 mm. long; petals yellow, 1.5–2 cm. long, glabrous; 4 of the stamens with short filaments and straight anthers, 3 with long filaments and curved erostrate anthers; legume short-stipitate, subterete, 6–9 cm. long, 1 cm. thick, rounded and short-rostrate at the apex, only tardily if at all dehiscent, glabrous, the valves thin, brittle; seeds numerous, transverse, surrounded by pulp, compressed, lustrous, 4–5 mm. long.

The seeds of this plant sometimes are used in Guatemala and other parts of Central America as a substitute for coffee.

Cassia leiophylla Vogel, Syn. Cass. 25. 1837. *Vogelocassia leiophylla* Britton in Britt. & Rose, N. Amer. Fl. 23: 259. 1930. *Cola de gallo*; *Frijolillo*.

Dry to wet thickets, sometimes in rocky stream beds, often a weed in waste ground or second growth, 1,400 meters or less; Alta Verapaz; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Suchitepéquez; Retalhuleu; San Marcos. Southern Mexico; British Honduras to Salvador and Panama; South America.

Plants herbaceous or suffrutescent at the base, erect to prostrate, most often procumbent, the stems a meter long or less, pilosulous or glabrate; stipules persistent, 12–16 mm. long; petiolar gland inserted between the lowest leaflets; leaflets 3 pairs, obovate or obovate-oblong, 2–6 cm. long, thin, obtuse or rounded at the apex, mucronate, pilosulous on both surfaces with spreading or subappressed hairs; peduncles axillary or forming small terminal panicles, mostly 2-flowered, the slender pedicels 2–5 cm. long; sepals very unequal, 8 mm. long or less, rounded at the apex, green, sparsely puberulent or almost glabrous; petals deep yellow, 1.5–2 cm. long, sparsely strigillose or almost glabrous; 3 lower anthers conspicuously rostrate; legume linear, falcate, 10–12 cm. long, 3–6 mm. wide, compressed, puberulent or glabrate, 2-valvate; seeds numerous, transverse, turgid, 3–3.5 mm. long.

Called “frijolillo” in Salvador; “hormiguera” (Campeche). The last name refers to the fact that the plants, like those of other species, are much frequented by ants.

Cassia leptocarpa Benth. Linnaea 22: 528. 1849. *C. leptocarpa* var. *hirsuta* Benth. Trans. Linn. Soc. 27: 531. 1871. *Ditremera*

leptocarpa Britt. & Rose, N. Amer. Fl. 23: 256. 1930. *Hediondilla*; *Kenkichoj* (Cobán, Quecchí); *Frijolín macho* (Petén); *Moquito*; *Frijolillo*.

Dry or wet thickets, often in waste or cultivated ground, 1,600 meters or less; Petén; Alta Verapaz; Baja Verapaz; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Suchitepéquez; Retalhuleu; doubtless in all the lowland areas. Southern Mexico; Honduras and Salvador to Costa Rica; Cuba; South America.

A coarse erect herb, a meter high or less, sometimes suffrutescent at the base, the stems pilose or glabrate; stipules linear, 6–9 mm. long, caducous; petiole bearing a large gland near its base; leaflets 4–7 pairs, membranaceous, ovate to elliptic, acuminate, 4–10 cm. long, usually abundantly pilose on both surfaces, sometimes glabrous; flowers yellow, racemose, the racemes axillary and terminal, with few or numerous flowers, the pedicels 1–3 cm. long; sepals elliptic to rounded, 6–8 mm. long, the outer ones pilose or glabrous; petals twice as long as the sepals; legume linear, turgid, 10–30 cm. long, 3–5 mm. thick, pilose or glabrous; seeds very numerous, transverse.

Known in Salvador, and probably also in Guatemala, as “frijolillo”; “zalche” (Yucatan, Maya). The name “hediondilla” refers to the fact that the crushed plant has an unpleasant odor. The Guatemalan material is referable to *C. leptocarpa* var. *hirsuta* Benth. It has been reported from the region as *C. hirsuta* L., a different species.

Cassia longirostrata (Britt. & Rose) Lundell, Phytologia 1: 214. 1937. *Peirania longirostrata* Britt. & Rose, N. Amer. Fl. 23: 264. 1930.

Thickets or mixed forest, sometimes in open oak forest, 1,300–1,800 meters; endemic; Sacatepéquez; Sololá (type from Sololá, *E. W. D. Holway* 134); Huehuetenango; Baja Verapaz; Quezaltenango.

A shrub of 1–2 meters, sometimes weak and reclining, the branches rather densely short-pilose; stipules filiform, 8–12 mm. long, caducous; petiole bearing a small gland between the lowest leaflets; leaflets 6–10 pairs, oblong or oblong-obovate, 1–2 cm. long, obtuse or rounded at the apex, green above, sparsely short-pilose, pale beneath, densely sericeous or sometimes only sparsely short-pilose; flowers large, yellow, mostly on 2-flowered peduncles, these sometimes forming terminal panicles, the pedicels slender, villous; sepals orbicular, 6–8 mm. long, glabrous or the outer ones sparsely pilose; petals 1.5 cm. long; anthers of the 2–3 longer stamens slender-rostrate; ovary densely lanate; legume linear, 8–12 cm. long, 5–6 mm. wide, stipitate, flat, 2-valvate, lustrous, pilosulous or glabrate; seeds numerous, transverse.

Cassia mayana Lundell, Phytologia 1: 215. 1937. *Chamaecrista Tonduzii* Britt. & Rose, N. Amer. Fl. 23: 290. 1930, not *Cassia*

Tonduzii Standl. 1919 (type from Guatemala without definite locality, A. Tonduz 649). *Kenké* (Cobán, Quecché).

Brushy slopes or plains, often in open fields, frequently a weed in waste ground, sometimes in pine-oak forest, 2,000 meters or less; Alta Verapaz; Izabal; Zacapa; Chiquimula; Santa Rosa; Escuintla; Huehuetenango.

Plants annual but sometimes persisting, erect or procumbent, simple or branched, herbaceous or suffrutescent at the base, 75 cm. high or less, the stems usually densely pilose with spreading hairs; stipules lanceolate, 4–7 mm. long; leaves small, the petiolar gland short-stipitate; leaflets 10–16 pairs, linear-oblong, 8–12 mm. long, rounded and aristate at the apex, glabrate above, pilose beneath with long appressed hairs, the costa almost central; peduncles axillary, 1 cm. long or shorter; sepals lanceolate, acuminate, appressed-pilose, 7–8 mm. long; petals yellow, 9–11 mm. long; legume linear, 4–5 cm. long or often shorter, 4 mm. wide, pilose with short subappressed hairs, flat, elastically 2-valvate.

Cassia nicaraguensis Benth. Trans. Linn. Soc. 27: 552. 1871. *C. Seleriana* Harms, Bull. Herb. Boiss. 7: 551. 1899. *Chamaesenna nicaraguensis* Britt. & Rose, N. Amer. Fl. 23: 250. 1930. *Vainillo*; *Cotorrón*; *Barajo*; *Flor de San Miguelito* (Jutiapa).

Brushy, often rocky slopes or plains, 2,300 meters or less; Izabal; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Guatemala; Quiché; Huehuetenango. Southern Mexico; Salvador to Panama.

A shrub or small tree of 2–5 meters, glabrous throughout; stipules foliaceous, large, semicordate, acuminate, deciduous, sometimes 2.5 cm. long; leaves large, eglandular; leaflets mostly 10–20 pairs, oblong, chartaceous, 4–8 cm. long, 1.5–2.5 cm. wide, obtuse or rounded at the apex and long-mucronate, slightly paler beneath; flowers large, racemose, the racemes arising from the upper leaf axils, many-flowered, equaling or longer than the leaves, the bracts oblong to obovate, 1–1.5 cm. long, buff, caducous; sepals buff, oval, rounded at the apex, 1–1.5 cm. long; petals yellow or sulphur-yellow, 2–2.5 cm. long, with conspicuous, dark, closely reticulate venation; legume linear, compressed, 7–12 cm. long, 1–1.5 cm. wide, lustrous, 2-valvate, elevated over the small seeds.

The shrub is a showy and handsome one, well worthy of cultivation.

Cassia occidentalis L. Sp. Pl. 377. 1753. *Ditremexa occidentalis* Britt. & Rose ex Britt. & Wils. Sci. Surv. Porto Rico 5: 372. 1924. *Moquillo*; *Frijolillo*.

A weedy plant, common in dry to wet fields and thickets, sometimes along sandbars or in cultivated or waste ground, 1,400 meters or less, most frequent at low elevations; Petén; Alta Verapaz; Izabal; Zacapa; Chiquimula; El Progreso; Jutiapa; Escuintla; Guatemala;

Retalhuleu. Southern United States; Mexico; British Honduras to Salvador and Panama; West Indies; South America; naturalized in the Old World tropics.

An erect annual, commonly a meter high or lower, stout, branched, sometimes somewhat suffrutescent at the base, glabrous or nearly so; stipules linear-lanceolate, 4-6 mm. long, caducous; leaves long-petiolate, the petiole bearing a large sessile globose gland near the base; leaflets 4-6 pairs, ovate to lance-ovate, 3-7 cm. long, acute or acuminate; flowers yellow, racemose, the racemes axillary, lax, few-flowered, the bracts lanceolate, caducous; sepals 6-9 mm. long; petals twice as long as the sepals; perfect stamens 7, the anthers exserted; legume linear, compressed, 6-12 cm. long, 6-9 mm. wide, straight or falcate, almost sessile, many-seeded, 2-valvate, the margins thickened; seeds compressed, brown, dull, transverse, 4 mm. long.

Called "yama bush" in British Honduras; "frijolillo negro" (Salvador). Like some other species of the genus, the plant has a disagreeable odor when crushed. The pulverized seeds are said to be much used in the North Coast as well as in other parts of Guatemala and Central America as a substitute for coffee. It may seem strange that substitutes for coffee should be used in a country where so much coffee is grown, but the fact is that many persons are too poor to buy coffee, despite its low price. In some regions an ointment prepared from the leaves is applied as a remedy for ringworm and other affections of the skin.

Cassia pentagonia Mill. Gard. Dict. ed. 8. no. 18. 1768.
Frijolillo blanco.

Dry or moist thickets, open oak forest, or sometimes in marshes about lakes, 500-1,650 meters; Chiquimula; Jalapa; Guatemala. Originally described from Campeche; Minas Geraes, Brazil.

A stout erect branched annual, a meter high or less, glabrous throughout or nearly so; petiole bearing an elongate gland below the lowest leaflets; leaflets 3 pairs, cuneate-obovate, 2-3.5 cm. long, rounded and mucronate at the apex; peduncles axillary, solitary or fasciculate, short, 1-flowered; sepals oval, 6-7 mm. long; petals yellow, little longer than the sepals; legume linear, 5-10 cm. long, about 1 cm. broad (including the wings), stipitate, contracted and long-rostrate at the apex, the seeds oblique, the valves broadly winged on the margins.

Strangely enough, this was reduced by Britton and Rose to synonymy under *Emelista Tora*, to which it bears but scant resemblance. If they had examined material of the species, undoubtedly they would have made it the type of another of the new genera with which they were so prodigal in treating *Cassia* for *North American Flora*. In Guatemala the plant is local, but often plentiful in the few localities where it has been observed. It grows mostly in the more arid regions and soon withers after the rains cease.

Cassia petensis (Britt. & Rose) Standl. Carnegie Inst. Wash. Publ. 461: 61. 1935. *Pseudocassia petensis* Britt. & Rose, N. Amer. Fl. 23: 231. 1930. *Canchinaic* (Petén, Maya).

Secondary upland forest, 300 meters or less; Petén (type from Petén, O. F. Cook & R. D. Martin 193). British Honduras.

A more or less scandent shrub, the branches armed with short stout recurved stipular spines, the young branchlets stout, sordid-pilous; leaves eglandular, small; leaflets 2-3 pairs, elliptic-oblong, mostly 3.5-5 cm. long, 1-2.5 cm. wide, obtuse or rounded at the apex, green above and sparsely pilous or puberulent, densely and softly pilose beneath; flowers yellow, racemose, clustered near the ends of short branchlets, the slender pedicels 5-10 mm. long; sepals oval to sub-orbicular, 5-6 mm. long, sparsely pilose or glabrous; petals twice as long as the sepals; anthers short-pilose; legume compressed but thick, about 30 cm. long and 1.5 cm. wide, subsessile, blackish, glabrous, the seeds numerous, transverse.

Cassia pilifera Vogel, Syn. Cass. 23. 1837. *Emelista pilifera* Pittier, Journ. Wash. Acad. Sci. 19: 176. 1929.

Moist or dry thickets, about 325 meters; Santa Rosa (Chiquimulilla). Southern Mexico, southward to Panama; Cuba; South America.

Plants usually herbaceous and probably annual, erect or usually procumbent, slender, a meter long or less, the stems pilose with long spreading hairs; glands present on the rachis between the leaflets, these 2 pairs, mostly obovate or rhombic, thin, 2-7 cm. long, obtuse or rounded at the apex, minutely pilous above, paler beneath, sparsely pilous; peduncles axillary, 1-2-flowered, usually shorter than the leaves; sepals unequal, broad, rounded at the apex, green, 6-10 mm. long, sparsely pilose; petals pale yellow, 1-2 cm. long; legume linear, compressed, 8-16 cm. long, 2-3 mm. wide, 2-valvate, long-rostrate, almost sessile, subfalcate; seeds numerous, longitudinal.

Easily recognized by the very long and abundant hairs of the stems, petioles, and peduncles.

Cassia pilosa L. Syst. ed. 10. 1017. 1759. *Chamaecrista macropoda* Standl. Contr. U. S. Nat. Herb. 17: 431. 1914 (type from Cerro Redondo, Santa Rosa, Heyde & Lux 6133). *Chamaecrista pilosa* Greene, Pittonia 4: 28. 1899. *Cassia macropoda* Standl. Field Mus. Bot. 4: 213. 1929.

Dry or moist, open places, sometimes on sandbars along streams, 1,400 meters or less; Santa Rosa; San Marcos. Chiapas; Salvador; Jamaica and Cuba; Colombia and Venezuela.

Plants herbaceous, sparsely branched, erect or procumbent, mostly 50 cm. long or less, the stems densely pilose with spreading white hairs and also appressed-pilous; stipules ovate-lanceolate, 6-13 mm. long, long-acuminate, striate-nerved, ciliate, subcordate; petiolar gland small, short-stipitate, sometimes none;

leaflets mostly 4-5 pairs, oblong or oblong-obovate, 5-25 mm. long, 3-7 mm. wide, rounded at the apex and mucronate, ciliate, glabrous or sparsely pilose, with conspicuous elevated nerves, the costa excentric; peduncles filiform, mostly longer than the leaves; sepals lanceolate, 4-5 mm. long, sparsely pilose or glabrous; petals yellow, 5-7 mm. long; legume oblong-linear, 2-4 cm. long, 3-4 mm. wide, elastically 2-valvate, rounded and apiculate at the apex, sparsely appressed-pubescent or glabrate, with numerous seeds.

This has been reported from Guatemala as *Cassia grammica* Spreng.

Cassia reticulata Willd. Enum. Pl. 443. 1809. *Chamaesenna reticulata* Pittier, Arb. & Arb. Legum. 130. 1928. *Barajo*; *Sambrán prieto*.

Moist or wet thickets, most plentiful along sandy or rocky stream beds, sometimes planted about dwellings, 800 meters or less; Alta Verapaz; Izabal; Jutiapa; Santa Rosa; Escuintla; Guatemala; Suchitepéquez; Retalhuleu; San Marcos. British Honduras to Salvador and Panama; South America.

A shrub or small tree, generally 2-6 meters high, the branches thick, densely short-pilose when young; stipules lanceolate, 1 cm. long or less, usually persistent; leaves large, eglandular; leaflets 8-12 pairs, broadly oblong or the upper ones broadly obovate to suborbicular, 7-10 cm. long, 2.5-5 cm. wide or even wider, rounded and often retuse at the apex, glabrate above, densely soft-pilose beneath; flowers racemose, the racemes axillary, often equaling the leaves, the bracts very large, obtuse, orange, caducous; pedicels 4-5 mm. long; sepals broad, rounded at the apex, minutely puberulent; petals bright yellow, 1.5 cm. long, with dark reticulate venation; legume linear, 7-15 cm. long, 12-15 mm. wide, flat, 2-valvate, short-stipitate, obtuse and short-rostrate, very lustrous, glabrous or sparsely pubescent; seeds linear, transverse, numerous.

The Maya name of Yucatan is reported as "yaaxhabin." The trunk sometimes is supported by prop roots similar to those of maize. The shrub is abundant in the lowlands of the North Coast as well as on the Pacific plains, often springing up abundantly on cleared land and forming dense stands of great extent. It sometimes forms dense thickets along stream beds or about the margins of lakes, growing at times in shallow water. It is very showy and noteworthy for the contrast in color of the bright yellow petals and the orange sepals and bracts. The leaves droop and fold together in the evening, and the name "barajo" is given the plant because at this time the folded leaflets vaguely suggest a *baraja* (deck of cards). Nearly always the branches and inflorescence are infested by small ants that bite severely. The plant is reported, and doubtless correctly, to have purgative properties, a characteristic of many species of *Cassia*.

Cassia Rosei Standl. Field Mus. Bot. 11: 159. 1936. *Grimaldia confusa* Britt. & Rose, N. Amer. Fl. 23: 300. 1930, not *Cassia confusa* Phil., 1893. *Nahuapate*.

Dry rocky slopes, sometimes in pine forest, 850–1,400 meters; Chiquimula; Jutiapa; Quiché. Oaxaca and Chiapas.

Plants perennial, erect or prostrate, from a thick woody root, the stems 60 cm. long or less, viscid-pilose with short or rather long hairs; stipules minute; petiole eglandular; leaflets 4, orbicular to elliptic or obovate, 1–2 cm. long, obtuse or rounded at the apex, more or less pubescent and viscid on both surfaces; flowers yellow, in terminal few-flowered lax racemes, the slender pedicels 1–1.5 cm. long; flower buds pointed; sepals viscid-pilose, acute, 8–10 mm. long; petals 1–1.5 cm. long; legume linear-oblong, 4–5 cm. long, 5–8 mm. wide, setulose-hirsute, compressed and flat, elastically 2-valvate.

Like other related species of the subgenus *Grimaldia*, this plant is used in domestic medicine.

Cassia Seleri (Rose) Lundell, Phytologia 1: 215. 1937. *Chamaecrista Seleri* Rose in Britt. & Rose, N. Amer. Fl. 23: 287. 1930. *Palomilla amarilla*; *Savilla*.

Dry or moist, brushy or open slopes or plains, sometimes a weed in cultivated fields, often in pine forest, 2,100 meters or less; Zacapa; Santa Rosa; Escuintla; Guatemala (type from Barranco de las Vacas, Salida de Isabel, Guatemala, C. & E. Seler 2286); Sacatepéquez; Chimaltenango; Sololá; Quezaltenango; Huehuetenango.

Plants essentially annual, usually erect, a meter high or less, sometimes persistent for more than one season and becoming suffrutescent near the base, sparsely branched, the stems pilose or puberulent; stipules lanceolate, acuminate, ciliate, 6–9 mm. long, striate-nerved; petiolar gland stipitate; leaflets 10–20 pairs, oblong-linear, 10–15 mm. long, 1.5–3 mm. wide, acute or obtuse and mucronate, glabrous, often ciliate, the costa slightly excentric; peduncles 1–1.5 cm. long, axillary; sepals lanceolate, 9–10 mm. long, long-acuminate, sparsely pilose; petals yellow, 12–15 mm. long; legume linear, flat, elastically 2-valvate, 3–5 cm. long, 4–5 mm. wide, pilose with short, curved or subappressed hairs, many-seeded.

This has been reported from Guatemala as *Cassia flavicoma* HBK., and reports of *C. patellaria* DC., *C. nictitans* L., *C. mimosoides* L., and *C. Chamaecrista* L. probably relate to this or one of the closely related species. These species of the subgenus *Chamaecrista*, that is, the majority of those recognized by Britton and Rose, are too closely related. It may be that the number of distinct forms is really large, but the keys to species published by those authors are obviously unworkable, although little worse, probably, than those of earlier students of the group.

Cassia serpens L. Syst. ed. 10. 1018. 1759. *Chamaecrista serpens* Greene, Pittonia 4: 29. 1899.

Moist or dry, open, often grassy or rocky slopes or plains, sometimes a weed in cultivated ground, 1,350 meters or less; Izabal; Zacapa; Chiquimula; Jalapa; Guatemala. Western Mexico; British Honduras; Honduras; Jamaica and Cuba; Colombia and Venezuela.

A small, very slender annual with prostrate or procumbent stems 40 cm. long or less, branched from the base, the branches glabrous or puberulent; leaves small, the petiolar gland small, slender-stipitate; stipules lanceolate, acuminate, 4–6 mm. long, striate-nerved; leaflets 4–9 pairs, oblique-oblong, 4–8 mm. long, rounded and mucronate at the apex, glabrous, few-nerved, the costa somewhat excentric; peduncles axillary, filiform, mostly longer than the leaves; sepals broadly lanceolate, 4–5 mm. long, acute, sparsely pilose; petals pale yellow, equaling or slightly longer than the sepals; legume oblong-linear, 1.5–2.5 cm. long, flat, elastically 2-valvate, 3 mm. wide, sparsely pilose with long spreading hairs, few-seeded.

Cassia siamea Lam. Encycl. 1: 648. 1785. *Sciacassia siamea* Britton in Britt. & Rose, N. Amer. Fl. 23: 252. 1930.

Native of the East Indies; sometimes planted for ornament in Guatemala, especially in Zacapa and Izabal, and in the latter department naturalized abundantly, especially about deserted town sites; planted also in other parts of Central America and in tropical America generally.

A tree of 6–12 meters or more with a dense and rather broad crown, the bark pale, the branchlets puberulent; stipules small, caducous; leaves eglandular, short-petiolate; leaflets 6–14 pairs, oblong or lance-oblong, 3–7 cm. long, 1–2 cm. wide, obtuse or rounded at the apex and mucronate, sometimes emarginate, chartaceous, glabrous and lustrous above, glabrous or minutely sericeous beneath; flowers bright yellow, racemose, the racemes corymbose-paniculate, few-many-flowered, the pedicels 3 cm. long or shorter; sepals suborbicular, 5–6 mm. long, puberulent; petals 12–16 mm. long; legume linear, coriaceous, compressed, 20–25 cm. long, 1–1.5 cm. wide, puberulent or glabrate, 2-valvate.

Cassia simplex Standl. Contr. U. S. Nat. Herb. 27: 199. 1928. *Chamaecrista simplex* Standl. Contr. U. S. Nat. Herb. 18: 103. 1916.

Moist slopes in pine forest, about 150–800 meters; Izabal (about Quiriguá); Huehuetenango. Panama; Colombia.

Plants annual, erect, slender, simple or with few branches, puberulent with short incurved hairs, a meter high or less; stipules linear-lanceolate, 1–1.5 cm. long, attenuate, ciliate; leaves short-petiolate, the glands of the petiole 1–2, scutellate, sessile; leaflets 15–25 pairs, linear-oblong, 5–8 mm. long, glabrous, sometimes ciliate, obtuse and mucronate, conspicuously nerved, the costa excentric; peduncles very short, axillary; sepals lanceolate, 5–6 mm. long, acuminate; petals yellow, slightly longer than the sepals; legume linear, 3–4 cm. long, 4 mm. wide, hirsute, flat, elastically 2-valvate.

Cassia Skinneri Benth. Trans. Linn. Soc. 27: 542. 1871.
Phragmocassia Skinneri Britt. & Rose, N. Amer. Fl. 23: 245. 1930.
Escoba.

Mostly on dry rocky plains and hillsides, 150–1,350 meters; type from some unspecified locality in Guatemala, *Skinner*; Zacapa; Chiquimula; Jalapa; Jutiapa. Southern Mexico; Salvador.

A shrub or small tree, 6 meters high or less, the young branchlets densely short-pilose; stipules setaceous, 12 mm. long, deciduous; leaf rachis bearing a slender gland between the lowest or lower leaflets; leaflets 4–7 pairs, cuneate-obovate or oblong, 2–5 cm. long, rounded at the apex, glabrous above, pilose beneath, at least on the veins; flowers very large, yellow, solitary in the leaf axils or crowded at the ends of the branches, long-pedicellate; sepals green, oval or rounded, 8 mm. long, almost glabrous; petals 2.5–3 cm. long, sparsely puberulent; legume compressed, 10–15 cm. long, 8–10 mm. wide, puberulent at first, indehiscent, slightly constricted between the seeds, many-seeded, articulate between the seeds.

Easy of recognition because of the jointed pods, unlike those of any other Central American species. This is the type of the genus *Phragmocassia* Britt. & Rose.

Cassia spectabilis DC. Cat. Hort. Monsp. 90. 1813. *Pseudocassia spectabilis* Britt. & Rose, N. Amer. Fl. 23: 230. 1930.

Moist forest or thickets, sometimes in second growth, 1,450 meters or less; Alta Verapaz; Jutiapa; Guatemala. Southern Mexico; British Honduras to Panama; Colombia and Venezuela.

A tree, sometimes 18 meters high but usually lower, the young branchlets pilosulous; stipules linear, somewhat persistent; leaves large, eglandular; leaflets 6–15 pairs, oblong-lanceolate, 3–7 cm. long, acuminate, glabrous or glabrate above, sparsely or densely pilosulous beneath; flowers yellow, racemose, the racemes few-many-flowered, axillary and forming terminal panicles 20–30 cm. long; sepals orbicular, 5–7 mm. long, puberulent; petals 1.5–2.5 cm. long; ovary glabrous; legume terete, indehiscent, coriaceous, glabrous, 15–30 cm. long, 1 cm. thick, septate between the seeds; seeds numerous, lenticular, transverse.

The tree often is planted for shade and ornament along the Atlantic lowlands of Central America. In Honduras it is known by the names “candelillo” and “frijolillo”; “pisabed” (British Honduras). The bark is light brown; wood whitish, turning pale yellow on exposure to air; heartwood brownish.

Cassia stenocarpa Vogel, Syn. Cass. 68. 1837. *Chamaecrista stenocarpa* Standl. Contr. U. S. Nat. Herb. 18: 104. 1916. *Tamarindillo*; *Cuchillito*; *Colhat* (Petén, Maya, fide Lundell); *Escoba* (fide Aguilar).

Brushy slopes or fields, frequently in second growth, often in open places or in savannas, occasionally on sandbars along streams, sometimes in thin forest, 1,350 meters or less; reported from Petén; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Sacatepéquez; Quiché; Quezaltenango. Mexico; British Honduras to Salvador and Panama; West Indies; northern South America.

Plants essentially annual but sometimes persisting, erect to almost prostrate, sometimes much branched, a meter high or less, the stems densely pilose with spreading hairs; stipules narrowly lanceolate, 10–14 mm. long; leaves short-petiolate, the petiolar gland long-stipitate; leaflets 10–25 pairs, linear or linear-oblong, 8–18 mm. long, 2–2.5 mm. wide, mucronate, glabrous or nearly so, often ciliate, the costa somewhat excentric; peduncles solitary or in fascicles of 2–3, axillary, 4–8 mm. long; sepals lanceolate, 6–8 mm. long, acute; petals yellow, 8 mm. long or less; legume linear, 2.5–5 cm. long, 4–5 mm. wide, flat, elastically 2-valvate, pilose with rather long, spreading hairs, many-seeded.

Called “canilla de zanate” in Salvador. In Guatemala this name is given frequently to any obscure plant that has no general common name, or at least none known to the person questioned, and is frequently thus given to shield a person’s ignorance, which he does not wish to admit. It is doubtful that there is any Central American plant known regularly by the name “canilla de zanate.”

Cassia stenocarpoides (Britton) Lundell, *Phytologia* 1: 215. 1937. *Chamaecrista stenocarpoides* Britton in Britt. & Rose, *N. Amer. Fl.* 23: 293. 1930.

Moist or rather dry thickets or open slopes or fields, sometimes in pine-oak forest, 900–2,100 meters; Alta Verapaz; Chiquimula; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Quezaltenango. Costa Rica.

Plants essentially annual but sometimes persisting, erect, a meter high or less, herbaceous or somewhat suffrutescent at the base, the branches densely short-pilose above with mostly brownish hairs; stipules narrowly lanceolate, 6–9 mm. long, ciliate, striate-nerved, long-acuminate; leaves short-petiolate, the petiolar gland obconic, sessile or nearly so; leaflets 10–20 pairs, oblong-linear, 7–12 mm. long, 2–2.5 mm. wide, obtuse or rounded and mucronate, ciliate, glabrous or sparsely pubescent, the costa somewhat excentric; peduncles axillary, mostly solitary, 1–1.5 cm. long; sepals lanceolate, acuminate, 6–7 mm. long, appressed-pilose; petals yellow, 10 mm. long; legume linear, 3–5.5 cm. long, 4–5 mm. wide, pilosulous with incurved and somewhat appressed hairs, flat, elastically 2-valvate.

Cassia Tagera L. *Sp. Pl.* 376. 1753. *Chamaecrista Tagera* Standl. *Contr. U. S. Nat. Herb.* 18: 104. 1916. *Frijolillo* (fide Aguilar).

Oak-pine forest or brushy slopes or fields, often in savannas, sometimes a weed in cultivated ground, 2,000 meters or less; Petén; Alta Verapaz; El Progreso; Izabal; Chiquimula; Jutiapa; Santa Rosa; Guatemala. Southern Mexico; British Honduras to Salvador and Panama; South America.

Plants perennial from a thick root, herbaceous, the stems mostly 40 cm. long or less, prostrate, densely leafy, glabrous or pubescent; stipules ovate-lanceolate, 4–10 mm. long, cordate, acuminate; leaves small, the petiolar gland stipitate; leaflets 2–3 pairs, cuneate-obovate, 5–10 mm. long, subcoriaceous, usually 2-nerved, glabrous, obliquely rounded at the apex, the veins prominent and reticulate, the costa excentric; peduncles filiform, sometimes longer than the leaves; sepals ovate, acute, 2–2.5 mm. long; petals yellow, little longer than the sepals; stamens 4–5; legume oblong, flat, 12 mm. long or less, 3–4 mm. wide, 1–4-seeded, sparsely appressed-pilosulous.

Cassia tomentosa L. f. Supp. Pl. 231. 1781. *Adipera tomentosa* Britt. & Rose, N. Amer. Fl. 23: 241. 1930. *Retama*.

Brushy hillsides, often along roadsides or in barren rocky places, sometimes planted about dwellings, 1,500–2,900 meters; Chimaltenango; Totonicapán; Quezaltenango; San Marcos; Huehuetenango. Southern Mexico; western and southern South America.

Usually a shrub of 1–2 meters but sometimes a tree of 7 meters, the branches tomentose; stipules small, linear, caducous; leaf rachis bearing glands between some or all the leaflets; leaflets 6–8 pairs, oblong, 1–5 cm. long, obtuse and often mucronate, green above, sparsely pilosulous, pale beneath, densely yellowish-tomentose; peduncles few-flowered, shorter than the leaves, axillary or clustered at the ends of the branches; sepals orbicular, pubescent, 9 mm. long; petals yellow, 12–15 mm. long; 3 of the stamens longer than the others, the anthers slightly curved, erostate; ovary densely lanate; legume linear, 8–12 cm. long, 7 mm. wide, stipitate, compressed but thick, pilosulous; seeds numerous, transverse, lustrous, 5 mm. long.

This species has a rather unusual distribution, being confined to the Pacific cordillera of Central and South America, but absent from Costa Rica and Panama, where it might be expected to occur. In Guatemala it is found only at high elevations and is a characteristic plant in Los Altos, where it remains green and flowers at seasons when most plants are withered. It flowers in the highlands in places where it is frosted or frozen every night during the height of the *verano*.

Cassia Tora L. Sp. Pl. 376. 1753. *Emelista Tora* Britt. & Rose ex Britt. & Wils. Sci. Surv. Porto Rico 5: 371. 1924. *Ejotil* (Izabal); *Ejote de invierno* (Zacapa).

Mostly in waste ground, often in dry to wet thickets, or a weed in cultivated ground, 1,000 meters or less; Izabal; Zacapa; Jalapa; Jutiapa; Santa Rosa; Sololá; to be expected in all the lowland departments, but apparently not widespread in Guatemala. Southern United States; Mexico; British Honduras to Salvador and Panama; West Indies; South America; naturalized in the Old World tropics.

Plants annual or essentially so, erect, stout, glabrous or almost so, usually a meter high or less; stipules linear-subulate, 1–1.5 cm. long; petiole bearing a slender gland between the lowest leaflets; leaflets 2–4 pairs, oblong-obovate to broadly obovate, 1.5–5 cm. long, rounded or obtuse at the apex, often mucronate, glabrous or sometimes appressed-pilose beneath; peduncles short, axillary, few-flowered; sepals unequal, oblong to rounded, 5–8 mm. long; petals yellow, twice as long as the sepals; perfect stamens 6–7; legume linear, tetragonous in cross section, usually 15–20 cm. long, 3–5 mm. thick, 2-valvate, falcate or almost straight, with strongly thickened margins; seeds numerous, longitudinal, compressed, lustrous, 5 mm. long.

Called “frijolillo” in Salvador, and probably also in Guatemala. The leaves are said to have the same purgative properties as the official drug senna, which is obtained from various Old World species of *Cassia*. In India *C. Tora* is sometimes cultivated for its seeds, used as a mordant in dyeing cloth blue. The seeds are sometimes used in Mexico and Central America as a coffee substitute and it is stated that they have been exported from the tropics to Europe for adulterating that article.

Cassia undulata Benth. in Hook. Journ. Bot. 2: 76. 1840.
Chamaefistula undulata Pittier, Trab. Mus. Com. Venez. 3: 151. 1928. *Palo barajero* (fide Aguilar).

Wet forest or thickets, often in second growth, 1,100 meters or less; Petén; Alta Verapaz; Izabal; Escuintla; Sololá. Southern Mexico; British Honduras to Panama; northern South America.

A shrub or small tree, often somewhat scandent, the branches angulate, short-pilose or almost glabrous; stipules lanceolate, often falcate; glands present on the leaf rachis between both pairs of leaflets; leaflets obliquely lanceolate or ovate, 4–10 cm. long, acute or acuminate, deep green and lustrous above, glabrous, little paler beneath, thinly sericeous with minute hairs; racemes short and few-flowered, axillary and in terminal corymbiform panicles, the bracts large, green, persistent; sepals rounded, 7–8 mm. long, sericeous; petals 12–14 mm. long, greenish yellow; perfect stamens 7; ovary sericeous; legume terete, 10–18 cm. long, 1 cm. thick or more, rostrate, glabrous, finally dehiscent along one suture, the valves fragile and often rupturing irregularly, the numerous seeds transverse, surrounded by abundant pulp.

In British Honduras, at least, the leaves are used like those of senna.

Cassia uniflora Mill. Gard. Dict. ed. 8. no. 5. 1768. *C. ornithopoides* Lam. Encycl. 1: 644. 1785. *C. sericea* Swartz, Prodr. Ind. Occ. 66. 1788. *Sericeocassia uniflora* Britton in Britt. & Rose, N. Amer. Fl. 23: 246. 1930. *Chipilín de coyote*; *Frijolillo blanco*; *Frijolillo*.

Moist or dry, open or brushy plains or hillsides, often a weed in cultivated ground, 200–1,000 meters; Zacapa; Chiquimula; Jalapa; Guatemala (Estancia Grande); Huehuetenango. Mexico; British Honduras; Salvador; Greater Antilles; Venezuela; Galapagos Islands.

An erect annual, a meter high or less, simple or branched, pilose throughout with rather long, appressed, mostly brownish hairs; stipules linear-subulate, 5–20 mm. long; leaves small, petiolate, with long stipitate glands between one or more pairs of leaflets; leaflets 2–4 pairs, oblong to broadly obovate, 2–5 cm. long, rounded and mucronate at the apex, somewhat narrowed to the obtuse base, glabrate above; peduncles short, axillary, few-flowered; sepals rounded, 6 mm. long; petals yellow, twice as long as the sepals; perfect stamens 7; legume linear, 2.5–5 cm. long, 4 mm. wide, the margins thick and continuous, the valves turgid, deeply impressed between the seeds and ultimately separating into joints; seeds numerous, oblong, truncate at each end.

The Maya name of Yucatan is reported as “tulub-bi-yan” or “xtuab.” The plant is abundant about Zacapa, where it often forms dense stands of wide extent on the plains. It is seldom seen except when there is plentiful moisture, for it withers as soon as the soil becomes dry.

Cassia Wilsonii (Britt. & Rose) Standl. Field Mus. Bot. 10: 219. 1931. *Chamaecrista Wilsonii* Britt. & Rose, N. Amer. Fl. 23: 290. 1930. *Escoba*.

Moist or dry thickets or open slopes or fields, sometimes in pine-oak forest, or on sea beaches, occasionally a weed in cultivated ground, 2,200 meters or less; Izabal; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez. British Honduras; Honduras (type from Tela).

Plants annual or sometimes persistent, herbaceous, erect to procumbent, a meter high or less, often much branched, the stems pilose; stipules lanceolate, acuminate, 4–8 mm. long; petiolar gland long-stipitate; leaflets 6–13 pairs, linear-oblong, obtuse or rounded at the apex and aristate, glabrous, ciliate, 8–12 mm. long, 1.5–2.5 mm. wide, conspicuously nerved, the costa excentric; peduncles axillary, mostly 6 mm. long or shorter; sepals lanceolate, acuminate, sparsely pilose, 6–9 mm. long; petals little longer than the sepals, yellow; legume flat, elastically 2-valvate, 3–5 cm. long, 5 mm. wide, thinly pilose with short subappressed hairs.

This has been reported from British Honduras as *Cassia stenocarpa* Vog.

Cassia xanthophylla (Britt. & Rose) Lundell, *Phytologia* 1: 215. 1937. *Isandrina xanthophylla* Britt. & Rose, *N. Amer. Fl.* 23: 269. 1930.

Known only from the type, Casillas, Santa Rosa, 1,300 meters, *Heyde & Lux* 4471.

Young branchlets, petioles, leaf rachis, and inflorescence densely yellowish-tomentose, in age glabrate; stipules caducous; leaves eglandular; leaflets 3 pairs, ovate or ovate-lanceolate, membranaceous, acute or acuminate, rounded at the base, 6–8 cm. long, deep green and glabrate above, densely yellowish-pubescent beneath; flowers racemose, the racemes axillary, 10–15 cm. long; sepals glabrous, 4–5 mm. long; petals 7–10 mm. long; anthers pilose.

This has been reported from Guatemala as *C. atomaria*. We have seen no material of the species, which is of rather questionable validity.

Cassia xiphoidea Bertol. *Fl. Guat.* 415. 1840. *Peiranisia Deamii* Britton in Britt. & Rose, *N. Amer. Fl.* 23: 261. 1930 (type from Gualán, Zacapa, *C. C. Deam* 291). *C. gualanensis* Lundell, *Carnegie Inst. Wash. Publ.* 478: 212. 1937. *Escobilla*; *Escobo*; *Barbón*; *Flor amarilla*; *Moco*; *Guachipilín* (Guatemala, probably an erroneous name).

Moist or dry, usually brushy plains and hillsides, often in pine-oak forest, 1,800 meters or less, most common at low elevations; Zacapa; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala (type from Volcán de Pacaya, *Velásquez*); Chimaltenango; Retalhuleu. Honduras.

A shrub or small tree of 1–5 meters, the slender branches sparsely or densely short-pilose; stipules small, setaceous; petiole bearing a gland between the lowest leaflets; leaflets 2–5 pairs, sometimes more numerous, 1–3.5 cm. long, thin, oblong to broadly obovate, rounded or obtuse at the apex, green above, pilosulous or almost glabrous, pale beneath, sparsely or often very densely pilose; peduncles slender, mostly axillary and 2-flowered, the pedicels 1–2 cm. long; sepals oval or suborbicular, unequal, 9 mm. long or less, glabrate; petals bright yellow, 2–3 cm. long; legume linear, 8–12 cm. long, 3–4 mm. wide, stipitate, flat, 2-valvate, pilosulous with subappressed hairs, many-seeded.

Called “comayagua” in Honduras. The material referred here is somewhat variable, and possibly should be subdivided, in which case there are probably available several names applied by Britton and Rose to plants of Mexico or other parts of Central America. Those authors list *C. xiphoidea* as a doubtful species, but the plant here described is the only Guatemalan one agreeing with Bertoloni’s diagnosis. The branches of this and related species frequently are used for making rough brooms or brushes.

Ceratonia Siliqua L. *Algarrobo*. Two trees of the carob are planted in La Aurora Park in Guatemala City. Native of the eastern Mediterranean region, but now planted in many regions of the earth. The pods, known as "St. John's bread," contain a sweet edible pulp, and sometimes are imported into the United States from the Mediterranean area. The tree is a large one with pinnate leaves and small, dark-red flowers, the pods commonly 10–30 cm. long, containing numerous large seeds.

Cercis Siliquastrum L. Native of the Mediterranean region. We have received flowering specimens from Guatemala, probably collected in La Aurora Park, Guatemala. It is a small tree with reniform, long-petiolate leaves, the small rose-purple flowers clustered in the leaf axils. At least two species of this genus are native in the United States and Mexico.

CRUDIA Schreber

Unarmed trees; leaves odd-pinnate, the leaflets alternate, usually coriaceous; stipules small and caducous or foliaceous and persistent; flowers small, racemose, the racemes simple and terminal or lateral on young branchlets; bracts and bractlets small, caducous; calyx tube short, the 4 segments membranaceous, imbricate, reflexed in anthesis; petals none; stamens 10, free, the filaments filiform; anthers ovate or oblong, the cells longitudinally dehiscent; ovary short-stipitate, the stipe free in the bottom of the calyx or affixed obliquely to the tube, few-ovulate; style filiform, short or elongate, the stigma small, terminal; legume oblique-orbicular to ovate or broadly oblong, compressed and flat, coriaceous, 2-valvate, the margins often thickened; seeds 1–2, large, without endosperm; cotyledons flat, the radicle short, straight.

About 15 species, mostly in tropical America, a few in the East Indies and tropical Africa. Two others have been described from Central America, one from Salvador, the other Nicaraguan. The generic name has sometimes been written *Crudya*.

Crudia lacus Standl. & Steyermark. Field Mus. Bot. 22: 339. 1940.

Known only from the type: Dept. Izabal, shores of Lago de Izabal, on side opposite San Felipe, between Punta Dos Reales and Punta de Lechuga, *Steyermark* 39611.

A tree, glabrous except on the flowers; leaflets 4, on petiolules 3 mm. long, slightly asymmetric, the lower ones somewhat smaller, subcoriaceous, lance-oblong or ovate-oblong, 5–9.5 cm. long, 2–4 cm. wide, acute or subacuminate with an obtuse tip, obtuse or almost rounded at the base and unequal, green and somewhat lustrous above; racemes terminal, solitary, dense, many-flowered, short-peduncu-

late, the rachis 5-6 cm. long, the pedicels 3-4 mm. long; sepals rounded-ovate, soon deciduous, sparsely pilose; ovary densely tomentulose, the style glabrous, 5 mm. long; legume 1-seeded, suboval to semiorbicular, 4-6.5 cm. long, 2.5-3.5 cm. wide, densely brownish-tomentulose, prominently reticulate-veined, somewhat rounded at each end, apiculate at the apex.

CYNOMETRA L.

Unarmed trees; leaves even-pinnate, the leaflets 1-few pairs, coriaceous, oblique; stipules caducous; flowers small, racemose, the racemes short, axillary or lateral, sometimes borne on the trunk; lower bracts ovate, dry, imbricate, finally deciduous, those of the raceme small; bractlets none or membranaceous and colored; calyx tube short, the 4-5 lobes thin, imbricate, reflexed in anthesis; petals 5, subequal or the lowest minute, imbricate; stamens usually 10, free, the filaments filiform; anthers small, uniform, the cells longitudinally dehiscent; ovary sessile or short-stipitate, free in the bottom of the calyx or obliquely inserted on the tube, 2-ovulate; style filiform, the stigma terminal, truncate or capitate; legume arcuate-ovoid or subreniform, rarely straight, turgid or somewhat compressed, rugose, verrucose, or rarely smooth, 2-valvate; seed filling the cavity, thick or compressed, the hilum ventral; endosperm none, the cotyledons thick-carnose, the radicle very short, straight, included.

About 30 species, in the tropics of both hemispheres. Probably two other species are found in Costa Rica and Panama, and one other has been described from southern Mexico.

Leaflets mostly very obtuse *C. colimensis*.
 Leaflets short-acuminate or long-acuminate *C. retusa*.

Cynometra colimensis Britt. & Rose, N. Amer. Fl. 23: 220. 1930. *Acaal*.

Along river banks, about 200 meters; Alta Verapaz (Río Ixvolay, between Río Apia and Río Soctelá, northwest of Cubilgüitz, *Steyermark* 45034). Western and southern Mexico.

A tree of 8-15 meters, the trunk sometimes 35 cm. or more in diameter, the branches slender, glabrous; leaves on very short petioles, the 2 leaflets very asymmetric, chartaceous, semiovalate or semielliptic, mostly 3.5-5 cm. long, obtuse, glabrous, with somewhat elevated, reticulate venation; flowers in short few-flowered dense racemes, the slender pedicels mostly 8-10 mm. long; sepals ovate or oval, 3 mm. long; stamens longer than the sepals; young legume puberulent; mature fruit brown, very densely lenticellate, turgid, about 2 cm. long and 1.5 cm. broad.

It is questionable whether this differs in any essential respect from *C. oaxacana* Brandegees.

Cynometra retusa Britt. & Rose in Standl. Trop. Woods 7: 5. 1926. *Pata de cabro*.

Wet forest, often at or near the edge of tidal streams, 400 meters or less; Alta Verapaz; Izabal (type from Entre Ríos, *S. J. Record* 1). British Honduras; Atlantic coast of Honduras.

A tree, reported to attain a height of 30 meters and a trunk diameter of a meter, but usually less than half as large, glabrous except in the inflorescence; leaf buds covered with large ovate striate bracts; stipules filiform, 8–10 mm. long, caducous; petiole 4–8 mm. long; leaflets 2, obliquely oblong, 6–15 cm. long, 3–4.5 cm. wide, abruptly short-acuminate or long-acuminate, with an obtuse submarginate tip, very oblique at the base, coriaceous, lustrous, reticulate-veined, especially beneath; flowers densely fasciculate in the leaf axils, the slender pedicels 1 cm. long or shorter, puberulent; calyx globose in bud, short-pilose; petals white, 5 mm. long, the stamens slightly longer, glabrous; ovary densely pilose; legume variable, sometimes subglobose, sometimes strongly compressed, 1.5–2.5 cm. long, brown, glabrate.

Called "fruta de danto" in Honduras. The trunk is often supported by buttresses. The tree grows most often at the very edge of the water, often leaning out across it. The new leaves are light-colored and conspicuous. The heartwood is pale brown, merging into the lighter-colored sapwood, hard, strong, tough, fairly straight-grained, fine-textured, not durable; locally it is employed in making charcoal.

DELONIX Rafinesque. Poinciana

Unarmed trees; leaves bipinnate, not stipulate, the leaflets small, very numerous; flowers large and showy, orange to scarlet, in terminal or axillary, corymbose racemes; calyx deeply 5-lobate, the lobes subequal, valvate; petals 5, long-unguiculate, broad; stamens 10, declinate, the filaments distinct, the anther cells longitudinally dehiscent; ovary sessile, many-ovulate, the style slender or short, the stigma truncate, ciliolate; legume broadly linear, hard and woody, compressed, 2-valvate, almost solid between the transverse oblong seeds; endosperm present, the cotyledons thick.

Three species, all African.

Delonix regia (Bojer) Raf. Fl. Tell. 2: 92. 1836. *Poinciana regia* Bojer in Hook. Bot. Mag. pl. 2884. 1829. *Arbol de fuego*; *Flor de fuego*; *Acacia*; *Framboyán*; *Guacamayo*.

Native of Madagascar, but now planted for ornament in most tropical regions; in Guatemala planted commonly for shade and ornament in most lowland regions, especially in the lower Motagua Valley, the Oriente, and on the Pacific plains; rarely if ever planted at middle elevations; on the Pacific plains and foothills often growing along roadsides, and frequently naturalized in thickets and other places remote from dwellings.

A tree with a broad spreading depressed crown, seldom more than 12 meters high, the trunk often almost a meter in diameter, with indications of incipient buttresses at the base, the bark thin, grayish brown, the branchlets pubescent; leaves large and fern-like, 30–50 cm. long, the pinnae 10–25 pairs; leaflets 20–40 pairs, oblong, 4–10 mm. long, rounded at each end, strigillose or almost glabrous; pedicels stout, 4–8 cm. long; calyx 2 cm. long, glabrous; petals spreading and often reflexed, 5–7 cm. long, flame-red, often mottled with orange, the blades very broad; stamens shorter than the petals; legume 40–60 cm. long, 5–7 cm. wide, dark brown or blackish, very hard and woody.

Although a great favorite in tropical and subtropical regions, as for instance in Florida, the royal poinciana has little to recommend it. It is extremely showy during its blooming period, which, however, is only a brief one, in Guatemala in the late months of the dry season or after the first rains. During the rest of the year it is a somewhat ungainly tree with clumsy branches that are brittle and easily broken, leafless during the dry season. The huge pendent pods hang on the tree for a long time. The wood is almost white, weak, soft, and light in weight.

DIALIUM L.

Unarmed trees; leaves odd-pinnate, the leaflets few, mostly alternate, coriaceous to membranaceous, the stipules small and inconspicuous; flowers small, cymulose, the cymes arranged in axillary or terminal panicles, the bracts and bractlets small, caducous; calyx tube very short, the 5 lobes much imbricate, herbaceous or petaloid; petals 1–2 and small, or none; stamens 2, rarely 3, free, the filaments short; anthers oblong, erect, affixed near the base, the cells longitudinally dehiscent; ovary sessile in the bottom of the calyx, or on a short stipe more or less adnate to the calyx, 2-ovulate; style short, subulate, the stigma terminal, small; legume ovoid-orbicular or subglobose, slightly compressed or almost terete, indehiscent, the exocarp hard or fragile, the endocarp usually pulpy; seed 1, more or less compressed, with endosperm; cotyledons flat, foliaceous or thin-carnose, the radicle short, straight.

About 10 species, in the tropics of both hemispheres. Only one species occurs in North America.

Dialium guianense (Aubl.) Sandwith in A. C. Smith, *Lloydia* 2: 184. 1939. *Arouna guianensis* Aubl. *Pl. Guian.* 16. *pl.* 5. 1775. *A. divaricata* Willd. *Sp. Pl.* 1: 156. 1797. *D. divaricatum* Vahl, *Enum. Pl.* 1: 303. 1805. *Paleta*; *Tamarindo*; *Palo de Lacandón*; *Tamarindo prieto*; *Chate*, *Upake* (Petén, Maya, fide Lundell); *Cuatchi* (Quecchi).

Dense wet mixed forest, 350 meters or less; Petén; Alta Verapaz; Izabal; Huehuetenango. Southern Mexico; British Honduras, along the Atlantic coast to Panama; Guianas and Brazil.

A large tree, often 30 meters high, with a trunk 60 cm. in diameter, the trunk buttressed, the bark thin, smooth, the tree glabrous throughout except on the fruit; leaflets 5-7, petiolulate, ovate or lance-ovate, 3-8 cm. long, rather abruptly acuminate or attenuate-acuminate, obtuse or rounded at the base, rather thin; panicles large and many-flowered, often 20-30 cm. long, the pedicels 1-2 mm. long; calyx segments obtuse, 2.5-3 mm. long; legume short-stipitate, obovoid to almost globose, 1.5-3 cm. long, broadly rounded at the apex, very slightly compressed or almost terete, brown, densely and minutely fulvous-tomentulose or in age glabrate, the pericarp thin, brittle, the mesocarp thick and fibrous; seeds blackish brown, somewhat compressed, lustrous, 1 cm. long.

Called "ironwood" and "wild tamarind" in British Honduras; "canillo" (Honduras); "guapaqui" (Chiapas); "paqui," "paque" (Oaxaca, Veracruz). This is one of the most abundant timber trees of the Atlantic lowlands of Central America and one of the most useful. On the North Coast of Guatemala it often constitutes a large element of the forest, and in coastal Nicaragua it probably forms about 15 per cent of the forest. The wood is uniform brown or reddish brown, deepening in color upon exposure, the sapwood thick, almost white; odor and taste none or at least not distinctive; specific gravity 0.90, weighing about 56 pounds per cubic foot; grain somewhat interwoven, the texture rather fine; not easy to work, finishes smoothly, very tough, strong, and durable. In Guatemala and other parts of Central America it is utilized for fence posts, bridge timbers, railroad ties, house construction, cart wheels, piling, and other purposes. It is too hard and has not enough figure to make it suitable for furniture. The logs will not float. The fibrous pulp surrounding the seeds is said to be edible, and it is much sought by peccaries and other animals. The fruit is produced in such abundance that it often covers the ground beneath the trees. In recent publications the name of the tree has been cited as *Dialium guianense* (Aubl.) Steud., but, as shown by Sandwith, in error, since the name really intended by Steudel was *Dialium guineense*. This is not the first time that these two regions, Guinea and Guiana, so far apart but with such easily confounded names, have been confused in botanical and more general literature.

HAEMATOXYLON L.

Glabrous trees; stipules often spinose, or the branches armed with large stout spines; leaves even-pinnate, or sometimes bipinnate; flowers small, yellow, in short lax axillary racemes, the bracts minute and inconspicuous; bractlets none; calyx tube short, the 5 segments subequal, imbricate; petals 5, oblong, spreading, the uppermost within the others; stamens 10, free, straight, the filaments pilose at the base; anthers uniform, the cells longitudinally dehiscent; ovary short-stipitate, free in the bottom of the calyx, 2-3-ovulate, the style filiform, the stigma

small, terminal; legume lanceolate, flat and compressed, membranaceous, not dehiscent at the sutures but opening by a longitudinal slit along the middle of each valve; seeds transverse, oblong; endosperm none, the cotyledons bilobate, the radicle straight.

The genus consists of only two species.

Racemes elongate, usually many-flowered; pedicels equaling or shorter than the flowers; petals 5-6 mm. long *H. campechianum*.

Racemes short and few-flowered; pedicels longer than the flowers; petals 7-8 mm. long *H. Brasileto*.

Haematoxylon Brasileto Karst. Fl. Columb. 2: 27. pl. 114. 1862-69. *H. boreale* Wats. Proc. Amer. Acad. 21: 426. 1886. *Campeche*; *Brasil*; *Palo de brasil*; *Espinita*.

Dry rocky brushy hillsides, 200-1,200 meters; Zacapa; Chiquimula; El Progreso; Baja Verapaz; Guatemala (Fiscal); Huehuetenango (region of Santa Ana Huista). Western Mexico; Salvador to Costa Rica; Colombia and Venezuela.

Usually a shrub of 2-3 meters, sometimes a tree as much as 9 meters high, the stout branches often tortuous and armed with long hard spines as much as 2 cm. long, the trunk crooked and deeply fluted, branching from near the base, the bark grayish or medium brown; leaves short-petiolate, the leaflets usually 6, broadly cuneate-obovate, mostly 1-2.5 cm. long, firm, often deeply emarginate, acute at the base, the nerves and veins very numerous and parallel, conspicuous, reticulate; racemes short-pedunculate, few-flowered, as broad as long, the pedicels very slender, 1-2 cm. long, glabrous or nearly so; petals yellow, 7-8 mm. long, the stamens almost as long; legume narrowly lance-oblong, 2-6 cm. long, 8-10 mm. wide, acute or obtuse, thin, delicately reticulate-veined.

The shrub is abundant on the dry hills and plains through the lower Motagua Valley, especially in the region between El Rancho and Salamá, where it is easy to recognize because of the deeply fluted trunk and the abundance of persistent characteristic pods, unlike those of any other member of the Leguminosae. The species has been reported by Lundell from Petén, where it is said to grow in logwood swamps of that area, in association with *H. campechianum*, but this is probably an error. *H. Brasileto* grows everywhere in Mexico, Central America, and South America, as far as known, in dry rocky places rather than in swamps. If the two species were found growing together, they could scarcely be regarded as distinct, since they are at best none too easily separable, except by the wood, which seems to have distinct properties in the two species. Some authors have considered *H. Brasileto* and *H. boreale* as distinct, but the available material from South and Central America shows no obvious differences of any degree. According to Tejada, a decoction

or infusion of the plant is employed in Guatemala for treating erysipelas and inflammation of the stomach.

The heartwood is rich orange when fresh, turning to dark red upon exposure. In the trade it usually is known by the name "brazilette" (from Spanish *brasileto*), usually is classed with brazilwood, *Caesalpinia echinata*, and supplies brasilin and not the hematin crystals of *H. campechianum*. Wood from Nicaragua is known locally as "brasil" and in the trade as "Nicaragua wood" or "hypernic," the latter applied to a superior quality. The wood was first shipped to England from the Atlantic side of Nicaragua, although it grows abundantly also on the Pacific side. It was sold in England at one time at £140 per ton, double the price then prevailing for logwood. It dyes a bright red that is very beautiful. Large amounts of the wood have been shipped to the United States from Mexico.

Haematoxylon campechianum L. Sp. Pl. 384. 1753. *Campeche*; *Palo de Campeche*; *Palo de tinta*; *Tinta*. *Logwood*.

Growing abundantly in swamps called *tintales*, often of great extent, in central and northern Petén, and reported also from north-western Alta Verapaz, perhaps in error. Yucatan Peninsula of Mexico; northern British Honduras; Honduras(?); West Indies, perhaps introduced there.

A small gnarled tree, generally 8 meters high or less, often only a shrub, the trunk crooked, deeply fluted, the bark light gray, the branches spreading, often armed with stout spines 1.5 cm. long or less, glabrous throughout or practically so; leaves short-petiolate, the leaflets 2-4 pairs, firm, cuneate-obovate, 1-3 cm. long, rounded or deeply emarginate at the apex, cuneate at the base, finely many-nerved, lustrous above, slightly paler beneath; racemes mostly dense and many-flowered, narrow, short-pedunculate, 2-12 cm. long, the pedicels filiform, 4-6 mm. long; petals yellow, narrowly obovate, 5-6 mm. long, the stamens of about the same length; legume lance-oblong, 2-5 cm. long, 8-12 mm. wide, mostly rounded or very obtuse at the apex, acute at the base, delicately veined.

The Maya name is "ec." This is one of the important trees of the Yucatan Peninsula and has had a profound influence upon the history of the region. Logwood and mahogany are the reasons for the present existence of the British colony of Belize in Central America, since this region was occupied centuries ago by British settlers in search of these two woods. Privateers at first obtained their supply by capturing Spanish vessels sailing from Campeche for Spain but later found it easier to obtain the woods from cuttings on the shore. Thus sprang up the settlement of Belize. In early days

logwood sold in England for as much as £500 per ton, but by 1883 it had dropped to £25-£35. It still is an important article of export from the whole area of its occurrence, and from 1924-27 the average annual export from British Honduras was 563 tons, valued at about £25 per ton. The tree grows rapidly and easily from seeds and soon reproduces itself where cut. It is exported in the form of billets 3 feet long. It is too heavy to float and is carried along the coast in small boats, or floated down the rivers in "bark logs" or floating cradles made of cabbage palm. The heartwood, the only part of commercial importance, is bright red at first, becoming darker upon exposure; sapwood thin, white or yellowish, sharply defined; has the odor of violets (*Viola*) when fresh; taste sweetish; very hard and heavy, the specific gravity about 1.00; weight about 62 pounds per cubic foot; grain irregular and somewhat interwoven, the texture fine; hard to cut, finishes smoothly, takes a high polish, is strong but rather brittle, is highly durable.

Logwood is used as a dye, and its use became known in Europe soon after the discovery of Mexico. It had long been used by the Indians of Mexico and Central America for coloring cotton cloth and other articles. Early attempts to use the dye in Europe were not successful because no method was known of making the color permanent. For this reason its importation into England was prohibited in 1581 by a law that was not repealed for almost a hundred years, long after the discovery of a process for making a fast dye from the extract, but during this prohibition the wood often was imported clandestinely under the name "blackwood" or other terms. In the United States the imported wood is reduced mechanically into small bits and the dye extracted by boiling in water. The peculiar coloring principle, haematoxylin, forms an orange-red solution with boiling water, becoming yellowish as it cools and recovering its former hue when treated; if left alone it finally turns black. Various colors can be obtained according to the mordants used, but the color for which it is most employed is black, obtained by alum and iron bases. It is employed also for manufacturing inks and in small amounts for medicinal purposes. It is an official drug of the U. S. Pharmacopoeia, being used as an astringent, particularly for treating dysentery and diarrhea. In Central America it has long been utilized for the same purpose. The Lacandón Indians of western Petén employ the wood for arrow shafts. Considerable amounts of the wood, cut in small pieces, may be seen in the Guatemalan markets, especially at Momostenango. It is

employed there for coloring wool for the textiles for which that area is famous. When questioned as to its origin, the Indian traders state that it comes from Cobán (where it does not grow) or from the *frontera mexicana*.

HYMENAEA L.

Large unarmed trees; stipules caducous; leaves petiolate, 2-foliate, the leaflets coriaceous; flowers large or medium-sized, whitish, in small short dense corymbiform terminal panicles, the bracts and bractlets caducous; calyx campanulate, the 4 lobes coriaceous, imbricate; petals 5, sessile, oblong or obovate, subequal, the uppermost lobe within the others and often larger; stamens 10, free, glabrous, the anthers uniform, oblong, longitudinally dehiscent; ovary short-stipitate, the stipe adherent to the calyx tube, few-ovulate; style filiform, the stigma small, terminal; legume obliquely obovoid or broadly oblong, very thick and hard or subterete, indehiscent; seeds few, the testa osseous; endosperm none; cotyledons thick, carnose, the radicle short, straight.

About 25 species, in tropical America, only the following in North America.

Hymenaea Courbaril L. Sp. Pl. 1192. 1753. *H. Candolleana* HBK. Nov. Gen. & Sp. 6: 323. 1824. *Guapinol*; *Cuapinol*; *Hoja de cuchillo* (Jutiapa); *Copinol*; *Palo colorado*; *Pacay* (Petén); *Pac* (Quechí); *Pacoj* (Baja Verapaz).

Chiefly in rather dry forest, on hillsides or plains, 1,300 meters or less, chiefly at 900 meters or lower; Petén; Alta Verapaz; Baja Verapaz; El Progreso; Izabal; Jutiapa; Santa Rosa; Escuintla; Guatemala; Suchitepéquez; Retalhuleu; Quezaltenango; Huehuetenango; doubtless in San Marcos. Western and southern Mexico; British Honduras to Salvador and Panama; West Indies; South America.

A small to large tree, sometimes 30 meters high with a trunk more than a meter in diameter, usually with small buttresses, the crown rounded or spreading, the bark smooth, grayish brown, the inner bark reddish brown, exuding a pale gum, glabrous except in the inflorescence; leaves short-petiolate, the leaflets sessile, lance-oblong to oblong-ovate, inequilateral, 4–9 cm. long, acute or short-acuminate, very unequal at the base, coriaceous, lustrous, closely reticulate-veined, penninerved; panicles dense, with few or numerous flowers, the pedicels short and thick; calyx densely puberulent, the tube 8 mm. long, the lobes oblong, 1.5 cm. long; petals whitish, thin, gland-dotted, equaling the calyx lobes; stamens whitish, 3 cm. long; legume broadly oblong, very hard and woody, dark brown, scarcely compressed, usually somewhat roughened, about 11 cm. long and half as broad; seeds few, oblong, 2–3 cm. long.

Called "locust" in British Honduras. The name "guapinol" and its variants are of Nahuatl derivation, signifying "tree pinol," in

logwood sold in England for as much as £500 per ton, but by 1883 it had dropped to £25-£35. It still is an important article of export from the whole area of its occurrence, and from 1924-27 the average annual export from British Honduras was 563 tons, valued at about £25 per ton. The tree grows rapidly and easily from seeds and soon reproduces itself where cut. It is exported in the form of billets 3 feet long. It is too heavy to float and is carried along the coast in small boats, or floated down the rivers in "bark logs" or floating cradles made of cabbage palm. The heartwood, the only part of commercial importance, is bright red at first, becoming darker upon exposure; sapwood thin, white or yellowish, sharply defined; has the odor of violets (*Viola*) when fresh; taste sweetish; very hard and heavy, the specific gravity about 1.00; weight about 62 pounds per cubic foot; grain irregular and somewhat interwoven, the texture fine; hard to cut, finishes smoothly, takes a high polish, is strong but rather brittle, is highly durable.

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allusion to the sweet, mealy, whitish, edible substance surrounding the seeds. This is much eaten in some regions, and in Guatemala the ripe pods are sold commonly in the markets for this purpose, often at a relatively high price. A *caserío* in Escuintla has been named Guapinol, and one in Santa Rosa, Los Guapinoles. The specific name *Courbaril* is derived from a vernacular name of South America. The pulp or meal of the fruit is used to flavor *atol* and other beverages. One of the products of the tree is a pale yellow or reddish, resin-like gum known in the trade as South American copal. The exudations from the trunk run to the ground and harden into lumps that eventually become buried in the soil, and it is said that a barrelful of them may sometimes be obtained from a large tree. A softer, less useful gum may be obtained directly from incisions in the trunk. The copal is used abroad and also locally for preparing varnish. It is sold in most of the Guatemalan markets, especially those of the highlands, in the form of small round cakes, wrapped in corn husks, to be burned as incense in the churches. Large amounts of it are used thus in Guatemala, as any one may well believe who has observed the Indian worshipers at Chichicastenango or San Francisco El Alto. A decoction of the bark is used in Honduras as a substitute for quinine, and the tree finds other applications in domestic medicine. When the pulp is fermented in water it is reported to yield a liquor similar to beer, and it is so utilized in various parts of Central America.

The wood is dark brown to orange, often with darker streaks, deepening in color upon exposure; sapwood rather thick, dingy white, yellowish, or pinkish; without distinctive odor or taste; hard and heavy, the specific gravity 0.80–1.05; weight 50–65 pounds per cubic foot; grain fairly straight to irregular, of medium texture; tough and strong, not easy to work, finishes smoothly but does not take a high polish; fairly durable. In Guatemala and elsewhere in Central America the wood is used commonly for making sugar-mill and other mill machinery, looms, cart wheels, boats, balls, furniture, and cabinetwork. The wood was formerly well known in European markets, but it is seldom exported now. The bark of old trees, formerly at least, was used for making bark canoes. Removed in a single piece, it was sewed together with rope or other cordage, calked with gum or resin, and then shaped with wooden crosspieces. Canoes large enough to carry 25 to 30 men are said to have been made in this manner. The tree is a handsome one because of its dense clean foliage and makes a good shade tree.

PARKINSONIA L.

Shrubs or small trees, armed with spines, the branches green; leaves bipinnate but appearing pinnate, almost sessile, the rachis very short, spinulose-tipped, the pinnae 1-2 pairs, the rachis very long and narrow, compressed, striate, green, the leaflets numerous, very small, entire; flowers large, yellow, racemose; calyx tube short, the 5 segments narrow, subequal; petals 5, spreading, subequal; stamens 10, distinct, the filaments villous at the base; anthers uniform, versatile, the cells longitudinally dehiscent; ovary short-stipitate, many-ovulate, the style subfiliform, the stigma small, terminal; legume linear, coriaceous, striate-nerved, 2-valvate; seeds longitudinal, oblong, the endosperm corneous; cotyledons flat.

A single species occurs in America. One other has been described from South Africa.

Parkinsonia aculeata L. Sp. Pl. 375. 1753. *Sulfato*; *Sulfatillo*; *Palo de rayo*.

A native of tropical America, but the native habitat uncertain; scarcely native in Guatemala or elsewhere in Central America, but possibly native in Mexico; planted occasionally in Guatemala, and more or less naturalized in some localities; known from Baja Verapaz, El Progreso, Jutiapa, and Quiché, and doubtless planted in some other departments.

A shrub or small tree, seldom more than 6 meters high, with an open crown, the trunk often crooked, the bark brown, smooth, the younger branches bright green, at first sparsely and inconspicuously pilose; spines stout, 3 cm. long or shorter; pinnae 1-2 pairs, resembling sessile pinnate leaves, 20-40 cm. long, the leaflets 10-25 pairs, linear to obovate, often early deciduous; racemes rather few-flowered and lax, the very slender pedicels 5-20 mm. long, the flowers glabrous; calyx 6-8 mm. long; petals bright yellow, twice as long as the calyx; legumes pendent, glabrous, 5-15 cm. long, 8 mm. broad, few-seeded, much constricted between the seeds; seeds about 1 cm. long.

It is barely possible that this tree is native about Lago de Güija (Jutiapa), where it grows plentifully along the margins of streams and on lake shores. Elsewhere in Central America it is rarely seen except where evidently planted. It is distinctive in appearance because of its bright yellow flowers, green branches, and sparse, pale, usually drooping foliage. The branches of wild plants often are hollow and inhabited by ants. The wood is hard, close-grained, light brown with yellowish sapwood, with a specific gravity of about 0.60. In some regions it is used for fuel, and it has been utilized for making paper. The foliage, young branches, and pods are eaten by stock.

Peltophorum inerme (Roxb.) Naves is in cultivation at Finca Mocá, Sololá, and possibly elsewhere. It is not uncommon in the

Canal Zone, where it makes a good shade tree. It is a native of the East Indies, a tree of about 30 meters at Finca Mocá, with large deciduous bipinnate leaves, the very numerous leaflets oblong and 1-2 cm. long. The showy, bright yellow flowers are borne in large, axillary and terminal panicles, the calyx covered with dense ferruginous pubescence. The pods are flat, indehiscent, 5-8 cm. long, 1-4-seeded, narrowly winged on the margins, the valves conspicuously nerved.

PHYLLOCARPUS Riedel

Tall unarmed trees; leaves even-pinnate, the leaflets large and broad, few or numerous; stipules narrow, deciduous; flowers scarlet, racemose, the racemes short, clustered on the older wood at defoliate nodes; bracts and bractlets caducous; calyx tube very short, the segments 4, subequal, imbricate; petals 3, obovate, imbricate, the uppermost one within the others and smaller; stamens 10, the filaments free above, the anthers uniform, ovate, versatile; ovary stipitate, free in the bottom of the calyx, few-ovulate, the style filiform, somewhat clavate at the apex, the stigma small, terminal; legume oblong, compressed and flat, thin, indehiscent, the upper suture winged; seeds large, oval, compressed, the radicle straight.

Two species, the other Brazilian.

Phyllocarpus septentrionalis Donn. Smith, Bot. Gaz. 55: 433. 1913. *Flor de mico*; *Guacamayo*.

Dry, rocky, thinly forested hillsides or ravines, 100-900 meters; Zacapa (type from Gualán, *Wilmatte P. Cockerell*); El Progreso.

A tree of 12-35 meters with a broad spreading crown, the branchlets, petioles, and racemes puberulent or almost glabrous; stipules falcate-lanceolate, 5-7 mm. long, acute, brown; leaves deciduous; leaflets 4-6 pairs, elliptic, 8 cm. long and 3.5 cm. wide or smaller, acute to very obtuse, obtuse and somewhat asymmetric at the base, green and glabrate above, paler beneath and pubescent or finally glabrate; racemes short and few-flowered, mostly in clusters of 2-4, the pedicels 10-15 mm. long, articulate near the base and bearing 2 small bractlets; sepals 9-11 mm. long, elliptic to orbicular, dark red, ciliate; stamen sheath 12 mm. long, the filaments 14-17 mm. long, bright red, the anthers 2-2.5 mm. long; ovary about 3-ovulate; legume 1-2-seeded, 12-17 cm. long, 4-4.5 cm. wide, the thin wing 10-12 mm. wide; seeds oval, 2.5 cm. long, 1.5 cm. wide.

The flowers are said to be fragrant. It is possible that the tree occurs in the north coast of Honduras, where the senior author once saw inaccessible flowering trees that probably belonged to this genus. *P. septentrionalis* has been introduced into cultivation in Florida, Panama, and elsewhere, but little information is available as to how it has fared there. It flowers in Panama; hence must have

attained a good size. In general appearance and in the color of its blossoms this tree suggests the poinciana (*Delonix*) and is almost equally showy. It blooms at the height of the dry season, in January and February. The tree is apparently in cultivation in La Aurora, Guatemala.

POEPPIGIA Presl

Large unarmed trees; leaves odd-pinnate, the leaflets numerous, small; flowers yellow, small, in small paniculate cymes, the bracts and bractlets narrow, membranaceous, caducous; calyx tube campanulate, the 5 segments subequal, scarcely imbricate, more or less connate above the disk; petals 5, imbricate, subequal, oblong, the uppermost within the others; stamens 10, free, the filaments glabrous, almost straight; anthers ovate or oblong, versatile, the cells longitudinally dehiscent; ovary stipitate, many-ovulate, the stipe obliquely inserted in the calyx tube; style short, conic or incurved, the stigma small, terminal; legume oblong-linear, membranaceous, compressed and flat, indehiscent, narrowly winged along the upper suture; seeds transverse, ovate, compressed; endosperm none, the cotyledons flat, foliaceous, cordate at the base.

A single species, in tropical America.

Poeppigia procera Presl, Symb. Bot. 1: 16. pl. 8. 1830. *Plumillo*.

Moist mixed forest, about 400 meters; Suchitepéquez; Retalhuleu; to be expected in all the Pacific coast departments. Southern Mexico; Salvador; Honduras; Cuba; Colombia to Brazil.

A shrub or tree, sometimes 12 meters high or more, with a trunk 30–35 cm. in diameter, the young branchlets and leaf rachis rather sparsely puberulent or pilosulous; stipules linear, 5–7 mm. long, deciduous; leaves 10–30 cm. long; leaflets about 20 pairs, oblong, 1–2 cm. long, glabrous or nearly so, slightly paler beneath, rounded at the apex; panicles small, dense, many-flowered, the flowers pedicellate; calyx 4 mm. long, sparsely puberulent, the lobes broadly ovate, obtuse or subacute; petals spatulate-oblong, 8–10 mm. long, obtuse; filaments shorter than the petals, glabrous; ovary pilose; legume glabrous, 4–9 cm. long, 1–1.5 cm. wide, very thin, obtuse and apiculate, acute at the base, long-stipitate, brownish.

Known in Salvador as “tepemiste,” “quebracho blanco,” “memble,” and “frijolillo.” The wood is hard, the sapwood white, the heartwood reddish and beautifully veined. It is employed in Salvador for axles of carts, railroad ties, and other purposes. The flowers are said to be much frequented by bees.

SCHIZOLOBIUM Vogel

Tall unarmed trees; leaves very large and fern-like, bipinnate, the leaflets small, numerous; flowers yellow, large and showy, racemose, the racemes axillary or in terminal panicles, the bracts minute; bractlets none; calyx tube obliquely turbinate, the lobes subequal, imbricate, reflexed in anthesis; petals 5, unguiculate,

ovate or rounded, subequal, imbricate, the uppermost one within the others; stamens 10, free, subdeclinate, the filaments scaberulous at the base, the anthers uniform, the cells longitudinally dehiscent; ovary sessile, affixed to one side of the calyx tube, many-ovulate; style filiform, the stigma minute, terminal; legume compressed, spatulate, 2-valvate, 1-seeded, the outer coat firm-coriaceous, separating from the thin membranaceous inner one; seed 1, borne near the apex of the legume, large, oblong, compressed, with endosperm; cotyledons compressed and flat, the radicle exserted, straight.

The genus consists of a single species.

Schizolobium parahybum (Vell.) Blake, Contr. U. S. Nat. Herb. 20: 240. 1919. *Cassia parahyba* Vell. Fl. Flum. 168. 1825; Icon. 4: pl. 71. 1827. *S. excelsum* Vog. Linnaea 11: 399. 1837. *S. Kellermanii* Pittier, Contr. U. S. Nat. Herb. 18: 232. 1917 (type from San Felipe, Retalhuleu, W. A. Kellerman 5566). *Plumillo*; *Plumajillo*; *Zorra*; *Cucté* (Alta Verapaz); *Copte* (Petén, Maya); *Guanacaste* (Petén).

Wet to dry, mixed forest, on plains or hillsides, often in second growth, 900 meters or less; Petén; Alta Verapaz; Izabal; Santa Rosa; Escuintla; Sololá; Suchitepéquez; Retalhuleu; San Marcos; doubtless also in Jutiapa, and probably in Quezaltenango. Southern Mexico; British Honduras to Salvador and Panama; South America.

A medium-sized to large tree, frequently 30 meters high, the trunk to 50 cm. or more in diameter, often with high buttresses, the outer bark thin, greenish gray, the inner bark pinkish, the crown broad, usually rather flat-topped; bractlets and petioles glabrous, viscid, the petiole bearing a large conic gland below the apex; leaves very large, on young trees as much as a meter long, the pinnae about 20 but variable in number; leaflets 15–20 pairs or more, narrowly oblong, 2–3.5 cm. long, green above, glabrous, lustrous, pale beneath, rather densely sericeous, obtuse or rounded and mucronate at the apex, obtuse at the base; flowers rather pale yellow, mostly in very large, terminal panicles, the branches sparsely pilosulous or almost glabrous, the pedicels elongate, articulate above the middle; calyx sparsely strigillose with blackish hairs, 1 cm. long, the lobes obtuse; petals 1.5–2 cm. long, narrow; stamens about equaling the petals; legume flat, glabrous, 8–12 cm. long, 2.5–5 cm. wide, long-attenuate to the base, rounded at the apex, coarsely reticulate-veined and somewhat rugose; seed oval, 20 mm. long and 12 mm. wide, strongly compressed, blackish brown.

Known in British Honduras as “quam” or “zorra”; “chapul-tapa” (Salvador); “tambor” (Honduras); “judío” (Veracruz); “gavilán” (Nicaragua); “quon” (Miskito dialect of Nicaragua). The names “quon” and probably also “quam” are derived from the local name of the curassow (*Crax globicera*), which is said to feed almost exclusively on the seeds when they are available. The tree is abundant in various parts of Guatemala, but especially along the North Coast. It is very showy and handsome during its brief

blooming season, when the trees, usually leafless, become one huge mass of color, visible from a great distance. Young plants, 2-3 meters high or more, usually are unbranched and bear at the apex a cluster of huge fern-like leaves, so that at a short distance they remind one of tree ferns. The young stems and petioles usually are covered with a viscous exudate that adheres to the fingers. Englesing, who collected material along the Atlantic coast of Nicaragua, states that the seeds, unlike those of many other Leguminosae, seldom are attacked by insects, and it is perhaps on this account that the tree is so common in second growth. The wood has a strong fecal odor when freshly cut, but when dry is without distinctive odor or taste; it is white, light and soft or moderately so, the softest specimens rather spongy but tough; grain variable from straight to decidedly roey, rather coarse-textured; wood saws rather woolly, is rather difficult to finish smoothly, is perishable in contact with the ground. It is not used locally but has been suggested as a promising source of paper pulp, especially because the tree grows with great rapidity.

SWARTZIA Schreber

Unarmed trees or shrubs, usually glabrous or nearly so; leaves odd-pinnate or 1-foliolate, the leaflets coriaceous or herbaceous; stipules usually minute; flowers yellow, racemose, the racemes mostly short, sometimes paniculate, the peduncles sometimes 1-flowered; bracts caducous, generally minute, the bractlets small; calyx tube very short or none, the calyx closed and entire before anthesis, variously ruptured in flower; petal usually 1, the standard, broad, ruffled, the other petals absent, or the 2 lateral ones present but minute; stamens numerous, free or nearly so, declinate and incurved-ascending, the filaments filiform; anthers uniform or nearly so, affixed near the base, the cells longitudinally dehiscent; ovary stipitate, usually incurved, several-ovulate, attenuate to the style, the stigma terminal and small or rarely capitate; legume ovoid or elongate, subterete or rarely compressed, coriaceous or carnose, 2-valvate or indehiscent; seeds reniform, ovoid, or globose, sometimes arillate, the cotyledons thick; radicle usually very short and inflexed.

About 125 species, in tropical America. Britton and Rose recognize 18 species from Central America, but the true number is probably less than half as many. It is difficult to find stable characters for separating the species, and many of those used by those authors are obviously unimportant.

Petals none; leaflets 11-15.....*S. cubensis*.
 Petal 1; leaflets 1-7.

Leaflets 3-7 in all or most of the leaves.

Leaflets 3 or sometimes only 1; leaf rachis broadly winged...*S. guatemalensis*.

Leaflets usually 5-7; leaf rachis very narrowly winged.....*S. Standleyi*.

Leaflet only 1 in all or most of the leaves.

Petiole broadly winged, the wing 4-7 mm. wide near the apex.

S. guatemalensis.

Petiole very narrowly winged. *S. ochracea*.

Swartzia cubensis (Britt. & Wils.) Standl. Carnegie Inst. Wash. Publ. 461: 61. 1935. *S. Lundellii* Standl. loc. cit. (type from La Libertad, Petén, C. L. Lundell 3613). *Llora-sangre*; *Cataox*, *Buluche* (Maya).

Common on limestone hills, 300 meters or less; Petén. Tabasco; Campeche; Yucatan; British Honduras; Cuba.

A tree of 12 meters or more, the trunk 45 cm. in diameter, the young branchlets brownish-tomentulose; leaf rachis puberulent, very obscurely winged near the apex of the node; leaflets 11-13, short-petiolulate, subcoriaceous, oblong or narrowly lance-oblong, 3-8 cm. long, somewhat narrowed to the obtuse or rounded apex, rounded or very obtuse at the base, glabrous above or nearly so, rather densely and minutely sericeous beneath or in age glabrate, the venation prominent and closely reticulate; racemes solitary or geminate, usually arising from defoliate nodes, lax and few-flowered, much shorter than the leaves, the rachis puberulent, the pedicels short; flower buds ellipsoid, 6 mm. long; petals none; legume usually 1-seeded, oblique-ellipsoid, 2-4.5 cm. long, glabrous, 2 cm. thick.

Known in British Honduras as "northern rosewood" or "bastard rosewood"; "catalox" (Campeche). A red sap exudes when the trunk is cut. The wood is white. The seed is subtended by an aril that is white at first but turns red in age.

Swartzia guatemalensis (Donn. Smith) Pittier, Journ. Wash. Acad. Sci. 11: 159. 1921. *S. myrtifolia* var. *guatemalensis* Donn. Smith, Bot. Gaz. 33: 251. 1902. *Tounatea guatemalensis* Britt. & Rose, N. Amer. Fl. 23: 346. 1930. *Sosolché* (Alta Verapaz).

Wet to rather dry forest or thickets, 700 meters or less; endemic; Alta Verapaz (type from Cubilgüitz, *Tuerckheim* 7839); Retalhuleu; Huehuetenango.

An almost glabrous shrub or small tree, sometimes 6-12 meters high, the branchlets strigose at first; leaf rachis and petiole broadly winged, the wing 4-7 mm. wide at the apex, narrowed below, reticulate-veined; leaflets 1-3, glabrous or practically so, oblong-lanceolate to ovate-lanceolate, mostly 5-16 cm. long, acuminate or long-acuminate, obtuse at the base, bright green, lustrous; racemes 2-5-flowered, strigose, the slender pedicels 12-15 mm. long; flower buds ellipsoid, the calyx 1 cm. long, splitting into 3 irregular lobes; petal 1 cm. long, 2 cm. wide; ovary long-stipitate, 6-8-ovulate.

Swartzia ochracea DC. Mém. Lég. 405. 1825. *S. macrosperma* Bertol. Mem. Accad. Bologna 11: 203. 1861 (type from Volcán de Agua, *Velásquez*). *Tounatea ochracea* Britton, N. Amer. Fl. 23: 344.

1930. *T. macrosperma* Britt. & Rose, loc. cit. *T. hondurensis* Britton, loc. cit. (type collected near Tela, Honduras). *S. simplex* var. *continentalis* Urban, Symb. Ant. 5: 364. 1908.

Moist forest or thickets, 1,000 meters or less; Santa Rosa; Escuintla; Sololá; Suchitepéquez; Quezaltenango; San Marcos; doubtless in Izabal. Southern Mexico; British Honduras to Panama.

A shrub or tree, usually 12 meters high or less, often flowering when only a shrub, glabrous throughout or nearly so, the young branchlets sometimes sparsely appressed-pilous; petiole 5–12 mm. long, very narrowly winged; stipules filiform, 4–7 mm. long, deciduous; leaflet 1, elliptic-oblong or lance-oblong to elliptic, 6–15 cm. long, acute or short-acuminate with obtuse tip, obtuse at the base, bright green, usually lustrous; racemes few-flowered, the slender pedicels 1–2.5 cm. long; petal yellow, 2.5–3.5 cm. wide, ruffled; ovary glabrous; legume oblong or ovoid, 2–3 cm. long or larger, long-rostrate, subterete, bright red or orange, 1–2-seeded; seeds large, black, surrounded by a white or reddish aril.

Called "naranjillo" in Honduras. Several other synonyms of this species have been published from Costa Rica and Panama. The Guatemalan plant has been reported as *S. grandiflora* Swartz, and has been confused with *S. simplex* (Swartz) Spreng. of the West Indies, from which it probably is specifically distinct.

Swartzia Standleyi (Britt. & Rose) Standl. Trop. Woods 34: 40. 1933. *Toumatea Standleyi* Britt. & Rose, N. Amer. Fl. 23: 347. 1930.

Chiefly in wet mixed forest, sometimes in *Manicaria* swamps, 600 meters or less; Izabal (type collected near Puerto Barrios, Standley 25069). British Honduras.

A rather slender shrub or small tree, sometimes 10 meters high, the branchlets, leaf rachis, and racemes densely short-pilose or puberulent; petiole and rachis terete, not or very obscurely winged; leaflets 5–7, or sometimes fewer in part of the leaves, oblong-lanceolate to ovate, thin, 4–10 cm. long, abruptly acuminate or long-acuminate, obtuse or acute at the base, puberulent on both surfaces or finally glabrate, the venation elevated and closely reticulate; racemes few-flowered, the pedicels in fruit 1–2 cm. long; legume ovoid or ellipsoid, 2–5 cm. long, strigillose or glabrate, orange or orange-red, 1–3-seeded, long-rostrate, long-stipitate, subterete.

This, like *S. ochracea*, usually grows in dense wet forest, sometimes occurring in abundance. The flowers are not conspicuous because as a rule they are few in number, but the pods often attract attention because of their brilliant coloring in red, orange, or yellow.

TAMARINDUS L. Tamarind

Unarmed trees; leaves even-pinnate, the leaflets small, numerous; stipules minute, caducous; flowers small, yellow tinged with red, racemose at the ends of

the branches; bracts and bractlets ovate-oblong, colored, caducous; calyx tube narrowly turbinate, the 4 lobes strongly imbricate, membranaceous; upper 3 petals subequal, imbricate, the uppermost one within the others and narrower, the 2 lowest ones minute, setaceous or scale-like; perfect stamens 3, connate into a sheath, the filaments short; anthers oblong, the cells longitudinally dehiscent; ovary stipitate, the stipe adnate to the calyx, many-ovulate; style elongate, rather thick, the stigma terminal, truncate, subcapitate; legume oblong or linear, somewhat incurved, thick, subcompressed, indehiscent, the epicarp crustaceous, fragile, the mesocarp pulpy, the endocarp thick, coriaceous, septate between the seeds; seeds obovate-orbicular, compressed, with a thick testa; endosperm none; cotyledons thick, the radicle short, straight, included.

The genus consists of a single species.

Tamarindus indica L. Sp. Pl. 34. 1753. *Tamarindo*.

Native of tropical Asia, probably of India, but now cultivated in most tropical regions, and in America often becoming naturalized; planted generally in the lowlands of Guatemala and naturalized in many localities, chiefly at 1,200 meters or less; Petén; Zacapa; Chiquimula; El Progreso; Baja Verapaz; Jutiapa; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu; San Marcos; doubtless also in other departments.

A handsome tree, often 15 meters high or more, with widely spreading or rounded, dense crown, the trunk thick, often twisted, sometimes a meter or more in diameter, often with conspicuous long roots upon the surface of the ground, the bark brown; young branchlets puberulent; leaves short-petiolate, glabrous or nearly so; leaflets 10-18 pairs, oblong, 12-25 mm. long, rounded or retuse at the apex, obliquely obtuse or subtruncate at the base; racemes few-several-flowered, mostly shorter than the leaves, the slender pedicels 6-10 mm. long; calyx 8-10 mm. long; larger petals slightly longer than the calyx; legume 5-15 cm. long, 2 cm. broad, brown and scaly; seeds brown, lustrous, 1 cm. broad.

The tamarind, a well-known tree through much of the lowlands of Central America, is planted commonly for shade and for its edible pods. It makes a fine shade tree, growing well with no attention. In Guatemala it is particularly conspicuous in the lower Motagua Valley, and especially at Zacapa, one of whose *barrios* has long been known as El Tamarindal because of the many giant tamarind trees there. In India a yellow dye is obtained from the leaves, and the seeds, young leaves, and flowers are used for food. Large quantities of the ripe pods are seen in Guatemalan markets, often far above the regions where the trees grow, as at Quezaltenango. The juicy, acidulous, pleasantly flavored pulp of the pods is eaten, or more often it is employed to prepare a cooling beverage like lemonade, or to flavor ices and sweetmeats. It gives a popular flavor to some of the carbonated *aguas gaseosas* so much consumed in Guatemala. The

pulp is official in the U. S. Pharmacopoeia and is reported to contain sugar and acetic, tartaric, and citric acids. The Maya name of the tree is reported as "pachuhuc" from Yucatan. The wood is fine-grained, dirty white or yellowish, with a specific gravity of about 0.94.

ZOLLERNIA Martius

Unarmed trees or large shrubs; leaves simple, coriaceous, often dentate or serrate, the petiole very short; stipules rigid; flowers small, racemose, the racemes axillary or in terminal panicles; bracts small, the bractlets minute or none; calyx tube very short, the limb before anthesis entire and acuminate, cleft and reflexed in anthesis or deciduous; petals 5, imbricate, the standard broader than the other petals and outermost; stamens usually 10, subhypogynous, the filaments very short; anthers uniform, linear, acuminate, affixed near the base, the cells longitudinally dehiscent; ovary sessile or stipitate, many-ovulate, the style short, subulate, the stigma small, obliquely terminal; legume ovoid, thick, 2-valvate; seeds solitary or few, ovate or orbicular, compressed; endosperm none; cotyledons broad, the radicle short, inflexed.

About 8 species of the genus are known. All except the following are confined to Brazil.

Zollernia Tango Standl. Trop. Woods 19: 6. 1929.

Wet forest, at or near sea level; Izabal. British Honduras; Atlantic coast of Honduras.

A very large tree, the trunk deeply fluted, glabrous or nearly so except in the inflorescence; stipules binate, linear-oblong, 2-3 mm. long, rigid, obtuse, persistent; leaves alternate, the petiole 2-4 mm. long; blades narrowly oblong or elliptic-oblong, 5-17 cm. long, 1.5-6 cm. wide, short-acuminate or long-acuminate, unequal at the base and acute or obtuse, coriaceous, remotely serrate with appressed or salient teeth, lustrous above, the veins prominent and closely reticulate, slightly paler beneath; racemes axillary, fasciculate, half as long as the leaves, lax and few-flowered, the axis puberulent, the slender pedicels 3-5 mm. long; upper portion of the calyx apparently circumscissile, the persistent portion broadly campanulate, thin, 3.5 mm. long, glabrous; petals white, 8 mm. long; stamens twice as long as the calyx tube; fruit globose, green, 2-3 cm. in diameter, glabrous, smooth, broadly rounded at each end; seed 1, ellipsoid, 1.5-2 cm. long.

Known in Honduras and British Honduras by the name "tango." The flowers are sweet-scented, with an odor similar to that of sweet peas (*Lathyrus odoratus*). The heartwood is chocolate-brown, the sapwood thick, yellowish, exceedingly hard and heavy, rather fine-textured, finishes very smoothly, and is very strong. It is suitable for tool handles. In Honduras it is utilized for cabinetwork and construction, also for ax handles.

III. PAPILIONATAE

Key to the tribes

- Stamens free 1. *Sophoreae*.
 Stamens united, or 1 of them sometimes free from the others.
 Valves of the fruit breaking into joints, or sometimes continuous but the fruits then produced in the ground. 6. *Hedysareae*.
 Valves of the fruit continuous; fruits never produced in the ground.
 Leaves digitately 3-foliolate. 2. *Genisteae*.
 Leaves pinnately 3-many-foliolate, if digitate with more than 3 leaflets.
 Plants tendril-bearing, or scandent and with even-pinnate leaves.
 7. *Vicieae*.
 Plants never tendril-bearing, never scandent and with even-pinnate leaves.
 Leaflets 3, or rarely only 1.
 Fruit very small, often shorter than the calyx, indehiscent or dehiscent, sometimes spirally coiled, not linear and 2-valvate; leaflets often denticulate; flowers solitary, umbellate, or capitate. 3. *Trifolieae*.
 Fruit much longer than the calyx, usually linear or oblong, never spirally coiled, 2-valvate; leaflets entire or lobate, never denticulate.
 Plants usually scandent; flowers racemose or fasciculate.
 8. *Phaseoleae*.
 Plants not scandent or twining; flowers capitate or umbellate.
 4. *Loteae*.
 Leaflets 5 or more in all or most of the leaves, rarely fewer.
 Fruit usually large, indehiscent, membranaceous to coriaceous, ligneous, or drupaceous; usually large shrubs or trees or woody vines. 9. *Dalbergieae*.
 Fruit dehiscent, never ligneous or drupaceous, sometimes indehiscent but then small and 1-2-seeded, or membranaceous-inflated; plants often or mostly herbaceous, never woody vines. 5. *Galegeae*.

1. *Sophoreae*

- Petal 1; ovules 2; fruit short, compressed, narrowly winged along the upper suture. *Ateleia*.
 Petals 5.
 Ovule 1; fruit with a large basal wing; leaflets pellucid-punctate.
 Leaflets acute; anthers longer than the filaments. *Myrozyllon*.
 Leaflets rounded or retuse at the apex; anthers shorter than the filaments. *Myrospermum*.
 Ovules 2 or more; fruit not winged; leaflets not pellucid-punctate.
 Stamens long-exserted. *Sweetia*.
 Stamens not exserted.
 Ovary and fruit sessile. *Ormosia*.
 Ovary and fruit stipitate. *Dussia*.

2. *Genisteae*

- Leaflets more than 3; flowers usually blue *Lupinus*.
 Leaflets 3, or the leaves often simple, 1-foliolate, or wanting; flowers yellow.

- Stamen tube cleft on one side; legume inflated... ..*Crotalaria*.
 Stamen tube not cleft; legume flat.....*Spartium*.

3. Trifolieae

- Fruit usually spirally coiled, often armed with spines.....*Medicago*.
 Fruit not coiled, unarmed.
 Leaves pinnately 3-foliolate.....*Melilotus*.
 Leaves digitately 3-foliolate.....*Trifolium*.

4. Loteae

- A single genus in Guatemala.....*Lotus*.

5. Galegeae

- Hairs of the pubescence usually attached by the middle; connective of the anther
 appendaged.....*Indigofera*.
 Hairs of the pubescence attached by the base; connective of the anther not
 appendaged.
 Seeds usually 1-2; leaflets usually conspicuously dotted with dark glands.
 Seed 1; large shrub or small tree.....*Apoplinesia*.
 Seeds 2 or rarely more.
 Stamens diadelphous; trees.....*Eysenhardtia*.
 Stamens monadelphous; herbs or shrubs.....*Dalea*.
 Seeds several or numerous; leaflets not gland-dotted.
 Seeds strophiolate; shrubs.....*Harpalyce*.
 Seeds estrophiolate.
 Legume inflated and bladder-like; shrubs or trees with yellow flowers.
Diphysa.
 Legume not inflated.
 Inflorescence terminal or leaf-opposed.
 Style barbate only at the apex.....*Tephrosia*.
 Style barbate along the inner side.....*Barbieria*.
 Inflorescence axillary.
 Legume transversely septate within; plants herbaceous or suffrutescent.
 Style glabrous; plants glaucous or glaucescent.....*Sesbania*.
 Style barbate; plants not glaucous.....*Cracca*.
 Legume not transversely septate within.
 Plants herbaceous, small, decumbent.....*Astragalus*.
 Plants trees or large shrubs.
 Style coiled.....*Lennea*.
 Style straight or slightly curved.
 Style barbate.....*Coursetia*.
 Style glabrous or nearly so.....*Ghircidia*.

6. Hedysareae

- Fruit not articulate, subterete, produced below the surface of the soil....*Arachis*.
 Fruit usually articulate and compressed, produced above the ground.
 Leaflets 3 or 4, rarely only 1.

Leaflets 4.

Plants scandent; bracts of the inflorescence small and inconspicuous.

Pouretia.

Plants not scandent; bracts large, green, conspicuous

Zornia.

Leaflets 8 or rarely only 1.

Stipels present at the base of the petiolules; flowers purple, pink, or white.

Desmodium.

Stipels none; flowers bright yellow

Stylosanthes.

Leaflets 5 or more in all or most of the leaves.

Terminal joint of the fruit samaroid, with a large terminal wing; more or less woody vines; leaflets 5

Nissolia.

Terminal joint of the fruit not winged.

Legume not articulate; slender annuals; leaflets numerous, about 20 pairs.

Chmacorachis

Legume articulate.

Plants scandent; leaflets usually 9

Chaetocalyx.

Plants not scandent.

Legume tetragonous; shrubs; leaflets 3-5

Pachecoa.

Legume compressed; leaflets usually more than 5, often very numerous.

Aeschynomene.

7. Vicieae

Leaves without tendrils; a slender woody vine

Abrus.

Leaves, at least some of them, terminated by tendrils; plants herbaceous.

Legume turgid, not compressed.

Leaflets dentate; style filiform

Cicer.

Leaflets entire; style dilated above

Pisum.

Legume compressed and flat.

Stamen sheath oblique at the apex; style barbate at the apex

Vicia.

Stamen sheath not oblique at the apex; style longitudinally barbate along one side

Lathyrus.

8. Phaseoleae

Flowers not closely resembling those of a bean or pea, either the standard or the keel much larger than normal.

Plants trees or shrubs, often armed with prickles; standard much larger than the other petals

Erythrina.

Plants woody vines, unarmed; keel much larger than the other petals

Mucuna.

Flowers closely resembling those of a bean or pea.

Style barbate about the apex or along one side.

Keel spirally coiled.

Peduncles 1-flowered

Minkelersia.

Peduncles few-many-flowered

Phaseolus.

Keel almost straight or arcuate, not spirally coiled.

Rachis of the inflorescence not nodose; vines or erect shrubs or herbs.

Clitoria.

Rachis of the inflorescence conspicuously nodose; herbaceous or woody vines.

Flowers yellow

Vigna.

Flowers usually purple, not yellow.

- Lower margin of the legume conspicuously glandular-serrulate and rough.....*Dolichos*.
 Lower margin of the legume not glandular-serrulate....*Pachyrrhizus*.
 Style glabrous.
 Rachis of the inflorescence conspicuously nodose.
 Vexillar stamen free.
 Calyx 4-lobate.....*Galactia*.
 Calyx 4-lobate but the uppermost lobe 2-dentate.....*Calopogonium*.
 Vexillar stamen more or less united with the others.
 Calyx almost equally 4-lobate.....*Dioclea*.
 Calyx conspicuously 2-labiate.....*Canavalia*.
 Rachis of the inflorescence not nodose.
 Ovules 1-2; flowers usually yellow.
 Seeds transverse; plants not twining.....*Eriosema*.
 Seeds longitudinal; plants twining.....*Rhynchosia*.
 Ovules numerous.
 Plants erect shrubs; leaflets gland-dotted beneath.....*Cajanus*.
 Plants herbaceous or, if suffrutescent, twining; leaflets not gland-dotted beneath.
 Corolla less than 8 mm. long; bracts deciduous; standard not appendaged.....*Teramnus*.
 Corolla more than 1 cm. long; bracts usually persistent; standard appendaged at the base.
 Calyx tube cylindric.....*Cologania*.
 Calyx tube broadly campanulate.....*Centrosema*.

9. Dalbergieae

Leaflets alternate.

Anther cells erect and dehiscent by a short terminal slit or divergent and dehiscent by longitudinal slits.....*Dalbergia*.

Anther cells parallel, longitudinally dehiscent.

Calyx obtuse at the base; fruit samaroid, with a large apical wing, rarely circinnate and not winged; flowers usually purple.....*Machaerium*.

Calyx acute at the base.

Flowers yellow; fruit suborbicular, winged on all sides.....*Pterocarpus*.

Flowers pinkish white; fruit with a large terminal wing.....*Vatairea*.

Leaflets opposite.

Fruit with 4 longitudinal wings.....*Piscidia*.

Fruit not winged, or with a single wing along the margin.

Flowers yellow; leaves opposite.....*Platymiscium*.

Flowers not yellow; leaves alternate.

Legume compressed and flat.....*Lonchocarpus*.

Legume not compressed.

Fruit drupaceous, subglobose, 1-seeded; leaflets numerous.....*Andira*.

Fruit dry, elongate, usually several-seeded, sometimes 1-seeded and globose; leaflets usually 5.....*Muelleria*.

ABRUS L.

Slender woody vines; leaves small, even-pinnate, the leaflets numerous, exstipellate, the petiole terminated by a bristle; flowers racemose, terminal or axillary on short branches, fasciculate at the nodes of the rachis, small, pink or whitish; calyx truncate, the teeth very short, the 2 upper ones subconnate; standard ovate, narrowed into a short claw more or less adherent to the stamen tube; wings narrowly falcate-oblong, the keel arcuate, longer and broader than the wings; stamens 9, connate into a cleft sheath, the anthers uniform; ovary subsessile, many-ovulate, the style short, incurved, not barbate, the stigma capitate; fruit oblong or linear, compressed, bivalvate, subseptate within between the seeds; seeds subglobose or short-oblong, lustrous.

About 5 species, in the tropics of both hemispheres, only one of them in North America.

Abrus precatorius L. Syst. ed. 12. 472. 1767.

Moist or wet thickets or forest, at or little above sea level; British Honduras; southern Mexico; Costa Rica; West Indies; South America; tropical Asia and Africa.

A small or large vine, often climbing over tall trees, the branches sparsely short-pilose or almost glabrous; leaflets 10–20 pairs, oblong, deciduous, 1–2 cm. long, rounded at each end, sparsely and minutely appressed-pilose; racemes short, crowded, many-flowered; calyx 2–4 mm. long; corolla pinkish, 9–12 mm. long; fruit oblong, 4 cm. long or shorter, 3–5-seeded; seeds small and bean-like, bright scarlet, with a large black spot at the hilum.

Called "John Crow bead" in British Honduras; "peonía" (Yucatan); "oxoac" (Yucatan, Maya). Other English names are "bead-vine," "wild licorice," and "crab's-eyes." The strong coarse stems are sometimes used as a substitute for twine. The stems and especially the roots have the flavor and odor of licorice, and they are reported to have been used in some regions as a substitute for it. The root is said to contain glycyrrhizin, the same principle found in commercial licorice (*Glycyrrhiza glabra* L.). The leaves are sensitive to changes in the intensity of light, drooping to a vertical position during the night and rising to a horizontal position in the morning. The plant has been reported to be poisonous to stock. The seeds are known to be poisonous, having been employed in the Old World for criminal poisoning of human beings, and are said to contain abric acid and two proteid poisons, one of which has received the name "abrine." The seeds are very handsome and often are strung to make bracelets and necklaces. Because of their uniform size, they have been much used in the Orient as weights by jewel merchants, and it is even stated that the carat was based upon the weight of *Abrus* seeds. In Central America, as far as we have observed,

the plant is a rare one, found but infrequently along the Atlantic coast. In southern Florida it sometimes becomes a pernicious weed, especially in orange groves. Such a grove seen by the senior author a few years ago was one great tangle of the vines, so densely interlaced that it had been found impractical to harvest the fruit. The grove resembled a gigantic spider web.

AESCHYNOMENE L.

Herbs, erect or procumbent, sometimes shrubs; leaves odd-pinnate, the leaflets numerous or few, small, entire, not stipellate; stipules setaceous or lanceolate; flowers small, yellow, often striped with dark red or purple, racemose, the racemes axillary or rarely terminal, simple or branched; bracts mostly stipuliform, the bractlets appressed to the calyx; calyx lobes subequal or connate to form a bilabiate calyx, the upper lobe entire or 2-fid, the lower one entire or 3-fid; standard orbicular, short-unguiculate; wings obliquely obovate or oblong, about equaling the standard; keel obovate and slightly incurved or narrow and strongly incurved, the petals sometimes barely coherent; stamens connate, the anthers uniform; ovary stipitate, 2-many-ovulate, the style incurved, naked, the stigma terminal; legume stipitate, composed of 2-many flat or somewhat convex joints, smooth or muricate, indehiscent or rarely dehiscent along the lower suture.

About 70 species, chiefly in tropical regions and mostly American. Probably all the Central American species are covered by the following treatment.

Stipules conspicuously produced below the point of insertion and more or less auriculate.

Leaflets acute or acutish, the costa close to the margin.

Joints of the fruit 5 mm. wide, sparsely ciliate but otherwise glabrous.

A. tricholoma.

Joints of the fruit about 3 mm. wide, usually hirsute, or at least pubescent.

A. americana.

Leaflets very obtuse, the costa central.

Fruit and stems sparsely or densely hispid.....*A. virginica.*

Fruit and stems glabrous, or the stems rarely very sparsely pilose.

Pedicels glabrous; flowers 10-12 mm. long; bracts entire.....*A. Deamii.*

Pedicels finely and densely setulose-hispidulous; flowers 7-8 mm. long; bracts dentate.....*A. sensitiva.*

Stipules not produced below the point of insertion.

Costa of the leaflets excentric, often very close to the margin; plants woody or suffrutescent.

Leaflets acute, the costa very close to one margin.....*A. compacta.*

Leaflets obtuse, mucronate, the costa excentric but not very close to either margin.....*A. fascicularis.*

Costa of the leaflets central or nearly so.

Plants woody throughout.....*A. nicaraguensis.*

Plants herbaceous.

Plants glabrous or nearly so, without viscid pubescence, erect.

A. paniculata.

Plants viscid-hirsute or viscid-pilose with spreading hairs, usually procumbent or decumbent.

Stipe of the fruit several times longer than the calyx; joints of the fruit 6-8. *A. falcata.*

Stipe of the fruit shorter than the calyx or but little exceeding it; joints of the fruit 2-3.

Joints of the fruit 2; racemes mostly shorter than the leaves.

A. hystrix.

Joints of the fruit 3; racemes longer than the leaves.

Joints of the fruit densely white-tomentose. *A. eriocarpa.*

Joints of the fruit glabrous or very sparsely pilose. . . . *A. brasiliana.*

Aeschynomene americana L. Sp. Pl. 713. 1753. *A. americana* var. *longifolia* Micheli in Donn. Smith, Bot. Gaz. 20: 284. 1895 (type from Casillas, Santa Rosa, Heyde & Lux 4172). *A. floribunda* Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 180. 1843. *Pega-ropa*; *Toronjokillo* (fide Aguilar).

Common in dry or wet thickets or fields, often in cultivated ground, frequent in ditches and other wet places, sometimes in pine-oak forest, 2,000 meters or less, most common at low elevations; Alta Verapaz; Izabal; El Progreso; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Suchitepéquez; Retalhuleu; Huehuetenango; doubtless also in several other departments. Mexico; British Honduras to Salvador and Panama; West Indies; South America.

Annual or essentially so, erect and sometimes more than a meter high, usually somewhat lower, sometimes decumbent or spreading, often bushy-branched, the stems striate, usually rather densely hirsute with yellowish, somewhat viscid hairs; stipules conspicuous, linear-lanceolate, striate, long-attenuate, produced at the base far below the point of attachment; leaflets numerous, linear or linear-oblong, mucronate, denticulate near the apex, glabrous, conspicuously nerved, the costa close to one of the margins, 5-15 mm. long; inflorescence lax, few-flowered, viscid-hirsute, sometimes rather dense and congested, 6-8 mm. long, buff with purplish streaks or dull purple almost throughout, usually long-pedicellate; fruit short-stipitate, composed of 4-8 joints, these almost semicircular, about 3 mm. broad, sparsely or densely pubescent or often viscid-hirsute.

Called "plumón" and "pie de paloma" in Salvador. The plant is one of the most common weeds of the Central American lowlands, and in Guatemala it extends well up into the mountains. It is most plentiful in roadside ditches and other wet places but often forms vast stands in old cornfields. Guatemalan material exhibits considerable variation in pubescence and form of the inflorescence and fruit, so much that it may be possible to find some means of segre-

gating one or two species from typical *A. americana*. However, the apparent differences or variations do not seem to be altogether constant. There is much variation in corolla color. In some colonies all the plants have buff corollas while in others the corollas are dull, rather dark purple.

Aeschynomene brasiliiana (Poir.) DC. Prodr. 2: 322. 1825. *Cassia biflora* Mill. Gard. Dict. ed. 8. 1768, not L. 1753. *Hedysarum brasilianum* Poir. Encycl. 6: 448. 1804. *A. biflora* Fawc. & Rendle, Fl. Jam. 4: 27. 1920.

Rocky open plains or hillsides, or brushy rocky slopes, sometimes in pine forest, 500–1,500 meters; Chiquimula; Jalapa; Escuintla; Guatemala. Southern Mexico; Costa Rica; Panama; West Indies; South America.

Plants annual, procumbent, often much branched, the stems sometimes a meter long, usually densely viscid-pilose; stipules small, striate, not extended below the point of attachment; leaves small, the leaflets 5–8 pairs, oblong-obovate, 8–12 mm. long, 4–6 mm. wide, rounded at the apex, glabrous on the upper surface or nearly so, densely short-pilose beneath; inflorescence laxly paniculate, longer than the leaves, few-flowered, viscid-pilose; flowers buff, 7 mm. long; pods normally 3-jointed, sometimes with 1 or 4 joints, reflexed, the joints about 3 mm. broad, usually with at least a few short whitish hairs on the faces.

Aeschynomene compacta Rose, Contr. U. S. Nat. Herb. 5: 191. 1899.

Dry brushy slopes, 250–400 meters; Zacapa (Río Hondo, Steyermark 29500). Michoacán to Oaxaca.

A shrub 1–1.5 meters high with slender or rather thick branches, these whitish-strigose; stipules linear-attenuate, striate, stiff, not prolonged below the point of attachment; leaves small, the leaflets usually 20 pairs or more, linear-oblong and somewhat falcate, mostly 5–7 mm. long, acute, glabrous above, whitish-pilose beneath, crowded, the costa adjacent to one of the margins; inflorescence mostly 1-flowered, the flowers short-pedicellate, butter-yellow, 8 mm. long, the standard pilose outside; fruit pubescent, the joints usually 2–3, about 4 mm. wide, almost free and connected only by a very narrow isthmus.

Aeschynomene Deamii Rob. & Bartl. Proc. Amer. Acad. 43: 52. 1907. *Zinzinacax* (Petén, Maya).

In marshes or in floating islands of vegetation, growing in water, at or little above sea level; Petén; Izabal (type from San Felipe, Lago de Izabal, C. C. Deam 26). British Honduras.

Plants herbaceous or suffrutescent, sometimes 3.5 meters high, branched, glabrous or nearly so; stipules small, subulate; leaflets about 18 pairs, linear-oblong, 1 cm. long, rounded and mucronate at the apex, glabrous, inconspicuously

veined; inflorescences 2-7-flowered, in anthesis much shorter than the leaves, the flowers long-pedicellate; bracts ovate, herbaceous, scarious-margined, acute; calyx glabrous, 2-parted, 9 mm. long; corolla glabrous, yellow, 12 mm. long; fruit about 10 cm. long and 6.5 mm. wide, glabrous, the margins thick, slightly undulate, not constricted between the seeds, the joints about 12.

Aeschynomene eriocarpa Standl. & Steyerl. Field Mus. Bot. 23: 9. 1943.

Moist or dry, open or brushy, often rocky slopes, 200-800 meters; endemic; Zacapa (type collected near Santa Rosalía, 2 miles south of Zacapa, *Steyermark* 29313); Jutiapa.

A prostrate annual, abundantly branched, slender, the stems densely white-pilose with short spreading hairs, a very few longer viscid hairs intermixed; stipules very small, broadly ovate, acute, striate-nerved; leaves small, the leaflets 3-4 pairs, broadly oblong-obovate, 5-8 mm. long, 3-5 mm. wide, broadly rounded at the apex, obtuse at the base, glabrous above, pilose beneath with rather long, slender, subappressed, whitish hairs; inflorescences longer than the leaves, few-flowered or sometimes racemose and with numerous flowers, the rachis often strongly zigzag, densely whitish-pilose and with a few longer viscid hairs, the bracts very broadly ovate, obtuse, pilose; calyx 3 mm. long, densely short-pilose; corolla yellow, 7 mm. long, the standard sparsely pilosulous; joints of the fruit usually 3, sometimes 2, very densely white-tomentose, the joints connected by a very narrow isthmus, semiorbicular.

Aeschynomene falcata (Poir.) DC. Prodr. 2: 322. 1825. *Hedysarum falcatum* Poir. Encycl. 6: 448. 1804. *A. elegans* Schlecht. & Cham. Linnaea 5: 583. 1830.

Stony fields or brushy slopes, often in pine forest, sometimes in marshes, 1,600 meters or less; Alta Verapaz; Izabal; Jalapa; Jutiapa; Escuintla; Sacatepéquez; Suchitepéquez; Huehuetenango. Southern Mexico; Costa Rica; Panama; South America.

Plants probably annual, erect or usually procumbent, a meter long or less, often much branched, the stems densely hispid and often with some viscid pubescence; stipules lanceolate, striate, acuminate, not produced at the base; leaflets mostly 4-9 pairs, obovate-oblong, 6-10 mm. long, rounded at the apex, sparsely appressed-pilose, slightly paler beneath, reticulate-veined; inflorescence mostly longer than the leaves, lax, several-flowered, densely viscid-hispid, the bracts small, lance-ovate; flowers 6 mm. long, deep yellow or buff, the standard sparsely appressed-pubescent; legume borne on a very long, slender stipe, the joints 4-8, sparsely puberulent, 2-3 mm. wide, deeply constricted at the point of junction with the next joint.

Aeschynomene fascicularis Schlecht. & Cham. Linnaea 5: 584. 1830.

Moist or dry, brushy, rocky slopes, in thin forest or in thickets, 1,400 meters or less; Petén; Zacapa; Chiquimula; Jutiapa. Mexico.

A slender shrub 2 meters high or less, often simple, commonly with a few long, slender, sparsely leafy branches, the stems whitish-strigose; stipules linear-lanceolate, long-attenuate, striate, short-pilose; leaflets numerous, oblong-linear, mostly 9–12 mm. long, rounded and mucronate at the apex, glabrous above, pilose beneath with lax whitish hairs, the nerves and veins conspicuous beneath and reticulate, the costa distinctly excentric but remote from both margins; flowers solitary or fasciculate in the leaf axils; dull yellow, short-pedunculate, 9–12 mm. long, the standard short-pilose; legume 5 mm. wide, deeply constricted between the seeds, the joints sparsely pilose with short pale appressed hairs.

The Maya name is recorded from Yucatan as “cabalpich,” and the plant is called also “pegapega.” It is said to be eaten there by cattle, but as it occurs in Guatemala the plants are too few to be of any importance as forage.

***Aeschynomene hystrix* Poir. Dict. Suppl. 4: 77. 1823.**

Open, often rocky, moist or dry slopes, 700–1,600 meters; Jutiapa; Escuintla; Huehuetenango. Southern Mexico; British Honduras; Panama; South America.

Plants herbaceous, annual or perennial, procumbent, the slender stems pilose or viscid-hispid, often much branched; stipules lanceolate, subulate-acuminate, striate, not produced at the base; leaflets usually 10–12 pairs, oblong, 6–8 mm. long, rounded at the apex and apiculate, rather thick, glabrous above, appressed-pilose beneath, reticulate-veined; racemes simple or often branched from the base, mostly shorter than the leaves, the bracts small, ovate; flowers 5 mm. long, yellow; joints of the fruit 2, puberulent or pilose, scarcely 3 mm. wide, separated by a narrow isthmus.

***Aeschynomene nicaraguensis* (Oerst.) Standl. Trop. Woods 34: 41. 1933. *Brya nicaraguensis* Oerst. Kjob. Vid. Medd. 13. 1853 (type from Nicaragua). *A. Calderoniana* Standl. Journ. Wash. Acad. Sci. 14: 93. 1924 (type from Santa Ana, Salvador).**

Chiquimula, Cerro Socorro, southeast of Concepción de las Minas, 1,700 meters, *Steyermark* 31117. Salvador; Nicaragua.

A slender shrub 2–2.5 meters high, sparsely branched, the young branchlets densely puberulent; stipules very small, ovate, deciduous; leaflets 5–10 pairs, oval-oblong or oblong-obovate, 9–18 mm. long, 5–8 mm. wide, rounded at the apex, obliquely rounded at the base, sparsely setose-strigose when young but soon glabrate, the venation somewhat prominent beneath and laxly reticulate; racemes few-flowered, shorter than the leaves, the flowers dark purple or dull yellow with purple stripes; calyx 2–2.5 mm. long, appressed-pilose; standard 6–7 mm. long, densely sericeous; joints of the fruit 1–2, semiorbicular, 10–15 mm. long, 6–8 mm. wide, densely whitish-strigillose or finally glabrate.

***Aeschynomene paniculata* Willd. ex Vogel, Linnaea 12: 95. 1838. *A. laevis* Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 180. 1845, not Noronha, 1790.**

Grassy or rocky, open slopes, sometimes in hilly pine forest, 1,400 meters or less; Izabal; Zacapa; Chiquimula; Jutiapa. Southern Mexico; British Honduras; Salvador; South America.

Plants erect, herbaceous, usually or always annual, a meter high or usually lower, sparsely branched, the stems very slender and wiry, sparsely leafy, striate, glabrous or nearly so; stipules small, lanceolate, striate, acute, not produced at the base; leaflets commonly 30–50 pairs, 6 mm. long or less, linear-oblong, obtuse or rounded at the apex; racemes lax, terminal and panicleate, the bracts minute, ovate; flowers pale yellow or whitish, striped with purple; calyx 3 mm. long; corolla 8 mm. long, the standard almost glabrous; legume short-stipitate, the joints 4–6, glabrous or minutely appressed-pilose, about 3 mm. wide, separated by a very narrow isthmus.

Called "lengua de pájaro" in Salvador.

Aeschynomene sensitiva Swartz, Prodr. Veg. Ind. Occ. 107. 1788. *Torontjilillo* (fide Aguilar).

Wet fields, marshes, or along streams, 1,400 meters or less, chiefly at very low elevations; Izabal; Baja Verapaz; Jalapa; Escuintla; Guatemala; San Marcos. Mexico; British Honduras to Panama; West Indies; South America; Africa.

An erect herb, 2 meters high or less, branched, the stems glabrous or somewhat glandular-scabrous; stipules produced at the base, obtuse or aristate-acute, deciduous; leaflets 15–20 pairs, oblong, 6–15 mm. long, obtuse or rounded at the apex, glabrous; racemes often longer than the leaves, lax, few-flowered, the bracts small, deciduous; flowers 7–8 mm. long, yellow striped with dark red or brown, the standard brown; legume 4–8 cm. long, 4–6 mm. wide, glabrous, very slightly constricted between the numerous articulations, slender-stipitate.

Aeschynomene tricholoma Standl. & Steyerl. Field Mus. Bot. 23: 10. 1943.

Damp thickets or brushy rocky slopes, 400–1,200 meters; Zacapa; Chiquimula (type collected on the divide on the road from Zacapa to Chiquimula, *Standley* 73714); Jutiapa (near Jutiapa); endemic.

An erect annual a meter high or less, branched, the stems densely viscid-hispid; stipules linear-attenuate, produced at the base, striate, pectinate-dentate, hispidulous; leaves small, the leaflets about 23 pairs, linear-oblong, 5–10 mm. long, obtuse or subacute and mucronate at the apex, denticulate on one side near the apex, glabrous, the costa strongly excentric, the nerves prominent beneath; racemes elongate, lax, several-flowered, about equaling the leaves, the branches viscid-hispidulous, the bracts lance-ovate, long-acuminate, coarsely dentate, the teeth tipped with long yellowish setae; flowers deep yellow striped with purple-brown, about 7 mm. long, the calyx bilabiate, glabrous; standard glabrous; legume glabrous except on the margins, there very sparsely ciliate, slightly curved on one margin, deeply constricted on the other, the joints usually 4, sometimes 5, semi-

orbicular, rather prominently and laxly reticulate-veined, the stipe little exceeding the calyx.

In general appearance as well as in most details this is like *A. americana*, but the fruit characters seem to be sufficient to justify its specific segregation.

***Aeschynomene virginica* (L.) B.S.P. Prel. Cat. N. Y. 13. 1888. *Hedysarum virginicum* L. Sp. Pl. 750. 1753. *A. hispida* Willd. Sp. Pl. 3: 1163. 1800.**

Wet thickets or fields, often in ditches or sandy river beds, often growing in shallow water, 1,350 meters or less; Zacapa; Jutiapa; Santa Rosa; Escuintla; Retalhuleu; San Marcos; Huehuetenango. Southern United States; Mexico; Honduras; Panama; West Indies; South America.

An erect annual, often much branched, 1.5 meters high or less, the stems viscid-hispid or in age often glabrate, hispidulous above, at least sparsely so; stipules ovate, acuminate, 8 mm. long or less, deciduous; leaflets 12-25 pairs, oblong or linear-oblong, 6-15 mm. long, obtuse or rounded at the apex, glabrous, the venation inconspicuous; racemes few-flowered; flowers dull yellow with orange spots or often salmon-red, 1 cm. long; standard glabrous; legume linear, 2.5-4.5 cm. long, 6 mm. wide, sparsely hispidulous or almost glabrous, slender-stipitate, only slightly constricted between the joints, these 5-10, almost square, easily separable, thick.

The leaflets in this as in most of the other species are somewhat sensitive to touch, folding together when the leaves are disturbed and probably also at night.

ANDIRA Lamarck

Usually large trees, unarmed, the leaves alternate, odd-pinnate, the leaflets generally opposite, the stipels setaceous or none; flowers mostly violaceous, scattered along the branches of a large terminal panicle, often densely crowded, subsessile; bracts and bractlets small, caducous; calyx truncate, the teeth short or obsolete; standard suborbicular, not appendaged; wings almost straight, oblong, obtuse, free; keel petals similar to the wings, not connate; vexillar stamen free or rarely connate with the others to form a sheath, the anthers versatile; ovary stipitate or rarely subsessile, 2-4-ovulate or sometimes 1-ovulate; style short, incurved, the small stigma terminal; fruit drupaceous, ovoid, indehiscent, the endocarp ligneous; seed 1, pendulous, the radicle very short, straight, superior.

Perhaps 30 species, in tropical America and Africa. One other Central American species has been described from Panama. The only other species of continental North America, *A. Galeottiana* Standl., of Mexico, has been collected in Tabasco and is to be expected in northern Petén.

Andira inermis (Swartz) HBK. Nov. Gen. & Sp. 6: 385. 1823. *Geoffraea inermis* Swartz, Prodr. Veg. Ind. Occ. 106. 1788. *A. excelsa* HBK. loc. cit. *Almendro*; *Almendro cimarrón*; *Guacamayo* (Izabal).

Wet to rather dry forest, on hillsides, plains, or in swamps, often abundant along stream banks, and frequent in pastures, sometimes on limestone, 900 meters or less; Petén; Alta Verapaz; Baja Verapaz; El Progreso; Izabal; Zacapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sololá; Suchitepéquez; Retalhuleu; San Marcos. Southern Mexico; British Honduras to Salvador and Panama; West Indies; South America; western Africa.

A large tree, sometimes 35 meters tall, with a thick trunk sometimes almost a meter in diameter, the crown spreading or rounded, often very dense, the branchlets sparsely pilose or glabrate; bark medium brown, the inner bark light pinkish brown; stipules linear-subulate, 2 cm. long or less, deciduous; leaves large, glabrous or nearly so; leaflets usually 9–11, oblong to ovate, mostly 5–8 cm. long, acute or acuminate, obtuse or rounded at the base, subcoriaceous, short-petiolulate, the nerves and veins obscure; panicles 15–30 cm. long, many-flowered, tomentose; calyx 3 mm. long, dark purple; corolla reddish purple, the standard 1 cm. long, glabrous; fruit usually oval, sometimes subglobose, 2.5–4 cm. long or when fresh even larger.

Sometimes known in Salvador by the names "almendro macho," "almendro del río," "almendro montés," or "almendro real"; "yabo," "yaba" (Yucatan); "maca colorada," "pacay," "macayo," "moca" (Tabasco); "cabbage-bark," "cornwood," "black blossom-berry," "carbón," "chaperno," "barley wood" (British Honduras); "iximché" (British Honduras, Maya). The wood is heavy, hard, strong, durable, and susceptible of a high polish; varying in color from yellowish to rose-colored, brown, or almost black; resistant to decay and insects. It is valued for construction purposes and wheelwright work. The name "cabbage-bark" is given to the tree because the ragged, somewhat unsightly bark suggests the trunks of some of the cabbage palms. The fresh bark has a disagreeable odor and mucilaginous taste. Together with the seeds it is used as a purgative, vermifuge, and narcotic (not in Guatemala, so far as known), but in large doses it is said to be a dangerous poison. The seeds are reported to contain a poisonous alkaloid. The almendro is one of the common trees of the Guatemalan lowlands and occurs in great abundance in some regions, especially on the Pacific plains, where the trees often form small, almost pure stands. The trunk frequently is supported by buttresses, which sometimes are 3 meters high. The tree is a handsome and showy one in flower, in March and April. The flowers are visited by myriads of bees, whose humming often becomes so

loud as to make one chary of approaching the tree. Fallen flowers or petals often form a dense carpet beneath the trees. The fruits with their large seeds doubtless are eaten by pigs and other animals, although no data are at hand regarding the subject.

APOPLANESIA Presl

Small trees, glandular-punctate; leaves odd-pinnate, the leaflets numerous, entire, exstipellate; stipules minute; flowers small, in terminal and axillary panicles, the bracts minute; calyx membranaceous, the lobes subequal, obtuse, accrescent in fruit and reticulate-veined; petals of about equal length, unguiculate, the standard obovate-oblong, reflexed; wings obliquely linear, the keel petals free, spatulate, obtuse, undulate; stamens 10, connate at the base into a short cleft sheath, the anthers uniform; ovary sessile, 1-ovulate, the style filiform, glabrous, the stigma oblique-capitate; fruit semiorbicular, compressed, half-included, coriaceous, gland-dotted, rugose, apiculate.

One other species has been described from Venezuela.

Apoplanesia paniculata Presl, Symb. Bot. 1: 63. *pl.* 41. 1831.
Madre de flecha.

Dry, brushy or thinly forested, often rocky hillsides or plains, mostly at 200 300 meters; Zacapa; El Progreso. Western and southern Mexico.

A small or medium-sized tree, commonly 6-9 meters high, with a rather broad, rounded crown, the branchlets glabrate; leaflets 5-8 pairs, oval or oblong, petiolulate, 1-7 cm. long, rounded or emarginate at the apex, rounded at the base, sparsely or densely black-dotted, at least beneath, puberulent or velutinous-pilous when young; panicles rather dense and many-flowered, about equaling the leaves, finely pubescent, the flowers short-pedicellate, racemose, white; calyx in anthesis 3 mm. long, in age pale green and 6-10 mm. long, dotted with black glands, the lobes suberect, rounded at the apex; fruit small and nut-like, puberulent.

The Maya names of Yucatan are "kiik-che" and "chulul." The latter signifies "bow," and the wood is said to have been used commonly among the Mayas for making bows. The name given the tree in Zacapa evidently alludes to a similar use there. Apparently the same use was spread into remote regions, for in western Mexico the tree is often called "palo de arco." The bark is reported to yield a yellow dye. The tree is abundant about Zacapa, where at the end of the rainy season the trees are conspicuous for a few days because of their dense masses of white flowers.

ARACHIS L. Peanut

Prostrate, chiefly annual herbs; leaves odd-pinnate, the leaflets usually 5, exstipellate; stipules adnate at the base to the petiole; flowers crowded in a dense

sessile axillary spike, sessile in the axis of a leaf or of an auriculate bract, or short-pedicellate; bractlets at the base of the calyx linear; calyx tube filiform, the lobes membranaceous, the 4 upper ones connate, the lowest one slender, distinct; petals and stamens inserted at the apex of the tube, the standard suborbicular, the wings free, oblong, the keel incurved, rostrate; stamens connate to form a closed tube, the alternate anthers elongate, subbasifixed, the others short and versatile; ovary sessile at the base of the calyx tube, 2-3-ovulate, after anthesis stipitate by the greatly elongate, rigid torus and continuous with it, terminated at the apex by a stigma-like callus; style long-filiform, the stigma minute; legume ripening beneath the soil, oblong, thick, reticulate, indehiscent, subtorulose, continuous within, the pericarp spongy; seeds 1-3, irregularly ovoid; cotyledons thick, carnos, the radicle very short, suberect.

About 7 species, all natives of South America, chiefly of southern Brazil.

Arachis hypogaea L. Sp. Pl. 741. 1753. *Maní*; *Mania*; *Cacahuate*, *Cacahuete* (seldom used in Guatemala, but understood, at least, by many persons). *Peanut*.

Native of southern Brazil; cultivated commonly in Guatemala, chiefly in the mountains but sometimes at low elevations.

An annual, with spreading hairs on the stems and petioles; leaflets obovate or broadly oblong, 2.5-5 cm. long, rounded and minutely mucronate at the apex, ciliate, glabrous above, pilose or glabrate beneath; calyx tube 2-4 cm. long, the limb 5 mm. long; corolla golden yellow, the standard 1 cm. long; fruit borne on a stiff stalk 5-7 cm. long.

The peanut, grown in such vast amounts in the United States for food and as a source of oil and stock feed, is not well known in Central America. The only country in which it is at all common is Guatemala, which has an abundance of sandy soil suitable for its cultivation. It is grown in substantial amounts in the Oriente and very commonly in the highlands, at middle or rather high elevations. The seeds are eaten either raw or roasted, and large sacks of them may be seen in most of the markets, especially at holiday times. Candy made from the nuts and *panela* (raw sugar) also is seen commonly, especially in Cobán. The roasted nuts usually are hard and damp, so hard as to be dangerous to the teeth, although that would not discourage people who are accustomed to eating raw *habas* (*Vicia Faba*). The Dirección de Agricultura reports the Guatemalan peanut production for 1938-39 as 950,800 pounds. More than half of this amount came from the Department of Guatemala, with smaller amounts from Chiquimula and San Marcos. In central Guatemala the peanut is called *mania* more often than *maní*, the latter being the current term in other parts of Central America and

in Cuba. Zayas believes that this term is of Antillean origin, because it was used by some of the earliest writers, such as Las Casas. The names "cacahuate" and "cacahuete," of Nahuatl derivation, signifying "ground cacao," are used commonly in Mexico. It is not known at what period the peanut was introduced into Central America, but its cultivation can not be very ancient. A *caserío* of Jutiapa bears the name of Cacahuatal (peanut plantation), and one in Chiquimula is called Cacahuatpeque, "peanut mountain." It would be interesting to know how the latter name, pure Nahuatl, originated. Peanuts could be grown profitably on a large scale in Guatemala and other parts of Central America to supply oil for cooking, since shortening is one of the principal imports of these countries. Freshly roasted peanuts seem to be little appreciated in Central America, where hot peanuts are rarely if ever obtainable. At a fiesta in San Juan Ostuncalco, a man was observed selling hot peanuts boiled for a short time in cane sirup, but they were so hard as to be all but inedible.

ASTRAGALUS L.

Chiefly annual or perennial herbs; leaves normally odd-pinnate, the leaflets entire, not stipellate; stipules free or adnate to the petiole; flowers mostly small, violet, purple, whitish, or pale yellow, racemose, spicate, or umbellate, the peduncles usually axillary; bracts commonly small and membranaceous; calyx tubular, the teeth subequal; petals long-unguiculate, the standard erect, ovate, the wings oblong; keel equaling the wings or slightly shorter, almost straight, obtuse; vexillar stamen free, the others connate, the anthers uniform; ovary sessile or stipitate, many-ovulate, the style filiform, straight or incurved, not barbate, the stigma small, terminal; legume sessile or stipitate, 2-valvate or rarely indehiscent, membranaceous to coriaceous, 1-2-celled; seeds generally reniform, not strophio-late, the funicle filiform.

One of the largest genera of Leguminosae, represented by perhaps a thousand species, only one of which is native in Central America. Many species occur in Mexico.

Astragalus guatemalensis Hemsl. Biol. Centr. Amer. Bot. 1: 264. 1880. *Atelophragma guatemalensis* Rydb. Bull. Torrey Club 55: 159. 1928. *Tarayché* (fide Aguilar).

Moist thickets, open banks, dry rocky thickets, sometimes along sandy stream beds, often in oak forest, 1,800-3,500 meters; El Progreso; Jalapa; Guatemala; Sacatepéquez (type from Volcán de Fuego, *Salvin & Godman*); Chimaltenango; Huehuetenango; Totonicapán; Quezaltenango; San Marcos. Chiapas; Honduras.

A slender perennial, the stems 50 cm. long or less, prostrate or procumbent, sparsely strigose; stipules scarious, deltoid, 6–9 mm. long, connate; leaflets 25–33, elliptic to oblong or obovate, 5–15 mm. long, truncate or retuse at the apex, glabrous above, sparsely short-strigose beneath; peduncles slender, 4–10 cm. long, the racemes dense, 2–4 cm. long; calyx rather densely pilose with short black hairs, the tube 3 mm. long, the subulate teeth 2 mm. long; corolla lilac or purple, 9–10 mm. long; legume glabrous, ellipsoid, short-stipitate, about 15 mm. long and 5–7 mm. wide, acute at each end, thick-walled, 2-celled; seeds 6–8, brown, 2.5 mm. long.

An inconspicuous plant, common at middle and high elevations in many parts of the Occidente.

ATELEIA Mociño & Sessé

Unarmed shrubs or small trees; leaves odd-pinnate, the leaflets subcoriaceous, the stipules minute and inconspicuous; flowers small, white, racemose, the racemes axillary, simple or paniculate; bracts minute; bractlets none; calyx truncate or with very small teeth; petal 1 (the standard¹, unguiculate, cucullate; stamens free, the anthers uniform, ovate; ovary short-stipitate, 2-ovulate, the stigma subsessile, inflexed; legume stipitate, semiobicular, compressed and flat, membranaceous, probably indehiscent, narrowly winged along the upper suture; seed ovate-reniform, compressed; cotyledons flat, carnose, the radicle rather long, inflexed.

About 7 species, 3 in Mexico, the others in the West Indies and South America.

Ateleia cubensis Griseb. Mem. Amer. Acad. Sci. II. 8: 180. 1861.

British Honduras, in open places or in swampy forest, almost certainly occurring in Petén. Campeche; Cuba.

A tree, sometimes 9 meters high with a trunk 20 cm. in diameter, the branches light brownish, with numerous large elevated lenticels, puberulent at first; leaflets about 9, petiolulate, elliptic or elliptic-oblong, 2.5–5.5 cm. long, obtuse or narrowly rounded at the apex, obtuse at the base, often lustrous above, glabrous, puberulent beneath when young; racemes very numerous, mostly simple, densely brownish-puberulent, mostly shorter than the leaves, many-flowered, the flowers short-petiolate, cream-colored, fragrant; calyx 2–2.5 mm. long, very broad, subacute at the base, densely puberulent, truncate; petal 5 mm. long; stamens long-exserted; fruit 1-seeded, samara-like, long-stipitate, glabrous, 1.5–2 cm. long, 10–12 mm. wide, rounded at the apex, acute or acuminate at the base.

The Maya name “tuxche” is recorded from British Honduras.

BARBIERIA DC.

More or less woody shrubs or vines; leaves odd-pinnate, the leaflets numerous, thin, entire, the stipels subulate; stipules subulate-acuminate; flowers large, in terminal and axillary racemes, in groups of 2–3 along the rachis, the bracts and bractlets subulate-acuminate; calyx large, tubular, the teeth subulate-attenuate, subequal; standard oblong, attenuate at the base into a claw, naked within; lower

petals long-unguiculate, the wings oblong, adherent to the keel and shorter than it; keel obtuse, about equaling the standard; vexillar stamen free, the others connate into a sheath, the anthers uniform; ovary sessile, many-ovulate, the style elongate, barbate along the inner side, the stigma small, terminal; legume linear, straight, flat and compressed, bivalvate, septate within between the seeds, transverse-impressed outside between the seeds; seeds transverse-oblong, not strophiolate, the funicles very short.

The genus consists of a single species.

Barbieria pinnata (Pers.) Baill. Hist. Pl. 2: 263. 1870. *Galactia pinnata* Pers. Syn. Pl. 2: 302. 1807. *Clitoria polyphylla* Poir. in Lam. Encycl. Suppl. 2: 300. 1811. *B. polyphylla* DC. Mém. Légum. 242. 1825.

Wet forest or thickets, 250–350 meters; Alta Verapaz. Southern Mexico; British Honduras; western South America; Greater Antilles.

An erect or scandent shrub with slender branches, the branches brown, densely hirsute with long brown ascending hairs; stipules 1 cm. long or shorter, erect; leaflets about 15, opposite, short-petiolulate, oblong or ovate-oblong, 2.5–6.5 cm. long, rounded at each end, glabrous above except along the costa, there sparsely hirsute, pale beneath, densely pilose with long appressed hairs; flowers red, 5.5 cm. long, short-pedicellate; calyx 2.5 cm. long, 6 mm. broad, densely puberulent and sparsely long-hirsute, the lobes half as long as the tube, narrow, with almost filiform tips; petals glabrous; legume 3.5 cm. long and 6 mm. wide, puberulent and hirsute.

The plant must be a rare one in continental North America, since very few collections, apparently, ever have been made.

CAJANUS DC.

Plants erect, suffrutescent, abundantly pubescent; leaves pinnately 3-foliate, exstipellate, the leaflets entire, resinous-punctate beneath; stipules caducous; flowers rather large, yellow and purple, scattered along the short axis of axillary pedunculate racemes; bracts caducous; bractlets none; calyx lobes acute or acuminate, the 2 upper ones connate to form a 2-dentate lobe; standard orbicular, reflexed, appendaged at the base with 2 reflexed auricles; wings obliquely obovate, the keel incurved at the apex, obtuse; vexillar stamen free, the others connate, the anthers uniform; ovary subsessile, many-ovulate, the style thickened above the middle, not barbate, slightly dilated below the oblique terminal stigma; legume linear, obliquely acute, compressed, bivalvate, the valves transversely impressed between the seeds, scarcely septate within; seeds subcompressed, the hilum lateral, oblong, not strophiolate.

The genus consists of a single species.

Cajanus bicolor DC. Cat. Hort. Monsp. 85. 1813. *Cytisus Cajan* L. Sp. Pl. 739. 1753. *Cajanus indicus* Spreng. Syst. Veg. 3:

248. 1826. *Cajanus Cajan* Millsp. Field Mus. Bot. 2: 53. 1900. *Alberja*; *Arbeja*; *Chicharo* (Petén); *Gandul*; *Cachito*; *Frijol chino*; *Frijol japonés*.

Native of the Old World tropics, perhaps of tropical Asia, cultivated for its seeds in most tropical regions, and often naturalized in tropical America. Grown commonly in Guatemala, mostly at 1,500 meters or lower, and more or less naturalized in hedges and thickets in many places.

Plants stiffly erect, branched, 1-3 meters high, often decidedly woody below; leaves on rather short petioles, the leaflets narrowly elliptic to lanceolate, 4-9 cm. long, acute or acuminate, puberulent above and grayish green, densely pale-tomentulose beneath, conspicuously nerved; flowers about 2 cm. long; calyx 1 cm. long, densely pubescent, the lowest lobe longer than the others; petals yellow, the standard often purplish outside; legume about 5-seeded, 5-8 cm. long, 12 mm. wide, long-rostrate, narrowed at the base; seeds gray or brownish, 7-8 mm. long.

Sometimes called "frijol de palo" in Salvador. The most common English name is "pigeon pea." In some parts of the earth this is an important food plant, and in India it is said to rank third in importance among the leguminous plants grown for food. In Central America it is of rather minor importance, but in Guatemala it is planted commonly at lower elevations, sometimes in fields of several acres. It is more favored perhaps by the West Indian residents of the Atlantic coast of Central America than by the Indian and Spanish population. However, it is grown in some quantity about Guatemala and Antigua and more commonly on the Pacific plains and foothills. Once established, the plants bear for several years and produce their seeds constantly. The seeds usually are eaten green and always are removed from the pods, but quantities of the dry seeds are sold in the markets, at least in part for use as food. In the Pacific bocacosta this plant often is grown as shade for young coffee bushes before the normal shade of leguminous trees is established.

CALOPOGONIUM Desvaux

Scandent herbs, or sometimes large, somewhat fruticose vines; leaves pinnately 3-foliolate, stipellate; flowers small or medium-sized, mostly bluish or violaceous, the peduncles axillary, fasciculate-racemose, elongate or short, the rachis nodose, the pedicels very short; bracts and bractlets small, caducous; buds not acuminate; 2 upper lobes of the calyx distinct or connate to form one 2-dentate one; standard obovate, with small inflexed auricles at the base; wings narrow, adherent to the keel, the keel shorter than the wings, obtuse; vexillar stamen free, the others connate, the anthers uniform; ovary sessile, several-many-ovulate, the style filiform, not barbate, the stigma terminal, capitate; legume linear, flat and compressed or

at maturity biconvex, bivalvate, septate between the seeds; seeds orbicular, somewhat compressed, not strophiolate.

About 12 species, in tropical America. Only the following are known from Central America.

Stems and legumes hirsute with long, stiff, spreading, usually brownish hairs.

C. mucunoides.

Stems and legumes not hirsute, or sometimes short-hirsute, the pubescence mostly appressed and whitish, the hairs short.

Racemes greatly elongate and many-flowered, usually 20–30 cm. long or more; leaflets large, mostly 4–7 cm. wide, very densely sericeous or tomentose beneath..... *C. caeruleum*.

Racemes shorter than the leaves, few-flowered; leaflets mostly 2 cm. wide or narrower, sparsely strigose or glabrate beneath.

Leaflets mostly oval or broadly ovate, sometimes lance-oblong, rounded or obtuse at the apex..... *C. galactioides*.

Leaflets lanceolate, long-acuminate..... *C. lanceolatum*.

***Calopogonium caeruleum* (Benth.) Hemsl.** Biol. Centr. Amer. Bot. 1: 301. 1880. *Stenolobium caeruleum* Benth. Ann. Wien. Mus. 2: 125. 1837. *Chorreque*.

Dry to wet thickets, 1,800 meters or less, chiefly in the tierra caliente; Alta Verapaz; El Progreso; Zacapa; Jalapa; Jutiapa; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu; San Marcos. Southern Mexico; British Honduras to Salvador and Panama; northern South America.

A large or small vine, climbing over shrubs or small trees, sometimes prostrate, herbaceous or somewhat woody below, the stems rather stout, terete, densely tomentose or short-pilose with short, whitish or brownish hairs, the nodes often greatly elongate; leaves long-petiolate, the leaflets broadly rhombic or rounded-rhombic, sometimes broadly ovate, mostly 5–9 cm. long, subacute to obtuse or narrowly rounded at the apex, commonly broadly rounded at the base, entire, conspicuously nerved, very densely pilose on both surfaces with appressed or short and spreading, whitish or fulvous hairs; racemes very long, 20–40 cm. long or more, stout, much interrupted, the flowers in few-flowered fascicles, sessile or short-pedicellate; calyx 4–5 mm. long, densely pilose, the lobes acuminate; petals violaceous, the standard glabrous, 1 cm. long; legume 5–7 cm. long, 7 mm. wide, acute or obtuse and apiculate, sessile, several-seeded, densely puberulent or short-pilose with mostly fulvous pubescence.

Called “bejuco de lavar” in Salvador, bunches of the tough stems being used by washerwomen for rubbing the dirt from clothing, in order to save soap. The vine, a common one of the Pacific plains and foothills, is rather showy when in flower.

***Calopogonium galactioides* (HBK.) Benth. ex Hemsl.** Biol. Centr. Amer. Bot. 1: 301. 1880. *Glycine galactioides* HBK. Nov.

Gen. & Sp. 6: 427. *pl.* 575. 1824. *Galactia belizensis* Standl. Field Mus. Bot. 11: 133. 1932 (type from El Cayo, British Honduras, *H. H. Bartlett* 11449).

Wet to dry thickets, often in brushy rocky places, sometimes in oak forest, 2,000 meters or less; Petén; Alta Verapaz; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Suchitepéquez; Retalhuleu. Southern Mexico; British Honduras; Costa Rica; Panama; southward to Venezuela.

Plants slender, probably perennial, herbaceous, sometimes twining about other plants but more often prostrate, densely hispidulous with reflexed fulvous hairs; leaves small, long-petiolate, the leaflets petiolulate, broadly ovate to oval or sometimes lance-oblong, mostly 2–6 cm. long, obtuse or rounded at the apex, rounded or obtuse at the base, thin, green above, usually glabrous except along the costa, paler beneath, thinly or sometimes densely pilose with mostly appressed hairs; flowers few, mostly clustered in the leaf axils, on short slender pedicels, white or cream; calyx 3 mm. long, appressed-pilose, the lobes very narrow, attenuate; corolla narrow, 7–8 mm. long; legume 2–3 cm. long, 4–5 mm. wide, densely pilose with short, ascending or rarely spreading hairs, or the hairs closely appressed, about 5-seeded, straight, sessile.

Calopogonium lanceolatum Brandeg. Univ. Calif. Publ. Bot. 6: 182. 1915 (type from Cerro del Boquerón, Chiapas). *Galactia acuminata* Steyermark in Standl. Field Mus. Bot. 22: 144. 1940 (type from Finca Juárez, Chiapas).

Dense rocky forest or on rocky brushy hillsides, 1,200–1,800 meters; Quezaltenango; San Marcos. Chiapas.

A small herbaceous vine, the stems green, sparsely pilose with reflexed appressed short hairs, the internodes elongate; leaves long-petiolate, the leaflets petiolulate, lanceolate or oblong-lanceolate, 4–9 cm. long, long-acuminate or long-attenuate, obtuse at the base, bright green above, glabrous except on the costa, paler beneath, thinly strigose, thin; flowers small, axillary, solitary or fasciculate, slender-pedicellate; calyx tubular-campanulate, 6–7 mm. long, appressed-pilose, the teeth short, subulate-acuminate; legume 3–4 cm. long, 3–4 mm. wide, fulvous-strigose, few-seeded, obliquely rostrate.

Calopogonium mucunoides Desv. Ann. Sci. Nat. 9: 423. 1826. *Stenobium brachycarpum* Benth. Ann. Wien. Mus. 2: 125. 1837. *C. brachycarpum* Benth. & Hook. ex Hemsl. Biol. Centr. Amer. Bot. 1: 300. 1880. *C. orthocarpum* Urban, Symb. Antill. 1: 327. 1899. *C. flavidum* Brandeg. Univ. Calif. Publ. Bot. 4: 376. 1913. *Mielillo* (fide Aguilar).

Moist or dry, rocky thickets, often on open banks, sometimes in pine forest, 1,500 meters or less; Petén; Alta Verapaz; Izabal; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Suchite-

péquez; Retalhuleu. Southern Mexico; British Honduras to Panama; West Indies; northern South America.

Plants herbaceous, probably perennial, usually prostrate and rooting at the nodes, sometimes scandent, the stems hirsute with long stiff spreading yellowish hairs; leaves long-petiolate, the leaflets short-petiolulate, orbicular to elliptic-ovate or rounded-rhombic, mostly 3-9 cm. long, rounded or very obtuse at the apex, obtuse to subtruncate at the base, fulvous-hirsute on both surfaces, the hairs spreading or appressed; inflorescences axillary, short, head-like, sessile or nearly so, or often long-pedunculate and short-racemose, the flowers usually few, sessile or nearly so; calyx 6-7 mm. long, hirsute, the lobes elongate, linear-attenuate; petals purple, little if at all exceeding the calyx; legume usually 2.5-3 cm. long, 3-5 mm. wide, thick, conspicuously impressed between the 5-6 seeds, hispid with long spreading brownish hairs.

CANAVALIA Adanson

Reference: C. V. Piper, The American species of *Canavalia* and *Wenderothia*, Contr. U. S. Nat. Herb. 20: 555-588. 1925.

Scandent or prostrate herbs; leaves pinnately 3-foliolate, stipellate; stipules small, sometimes wart-like, inconspicuous; flowers rather large, purplish, violaceous, pink, or white, fasciculate-racemose, the peduncles axillary, elongate, nodose, the bracts minute, the bractlets small, caducous; calyx lobes connate to form 2 lips, the upper lip large, truncate or bilobate, the lower lip much smaller, sometimes minute, entire or 3-fid; vexillum large, suborbicular, reflexed; wings narrow, subfalcate or somewhat twisted, the keel broader than the wings, incurved, obtuse, or obtusely rostrate, the beak inflexed or spiral; vexillar stamen free at the base, connate above with the others, the anthers uniform; ovary substipitate, many-ovulate, the style incurved or involute with the keel, not barbate, the stigma small, terminal; legume oblong or broadly linear, compressed or turgid, winged or costate longitudinally near the upper suture, 2-valvate; seeds ovate-rounded, somewhat compressed, the hilum linear.

About 50 species, in the tropics of both hemispheres. Probably a few additional species are found in southern Central America. Piper recognized *Wenderothia* as a genus distinct from *Canavalia*, but no advantage seems to be gained by altering Bentham's concept of the group.

Upper lip of the calyx entire; standard petal without basal auricles; valves of the fruit with 3-4 longitudinal costae, one very close to each suture, 1 or 2 toward the middle; leaflets usually or at least often densely pilose, sericeous, or tomentose beneath. Subgenus *Wenderothia*.

Valves of the legume each with 4 longitudinal costae, 1 at each suture, the other 2 equidistant from the margins..... *C. bicarinata*.

Valves of the legume each with 3 longitudinal costae, 1 at each suture, the other near the middle.

Leaflets glabrous, more or less conspicuously white-punctate beneath.

C. munda.

Leaflets at least sparsely appressed-pilose beneath, often densely pilose to more or less tomentose, not punctate.

Lower calyx lobes relatively large, ovate, subequal; racemes very dense, congested; calyx very densely pilose with long, soft, more or less spreading hairs.....*C. hirsuta*.

Lower calyx lobes small, triangular, the middle one narrower and longer; racemes not very dense; calyx sparsely or densely sericeous...*C. villosa*.

Upper lip of the calyx bilobate; standard auriculate at the base; valves of the fruit with 1-4 longitudinal costae, these all very close to the margins.

Fruit about 20 times as long as broad; seeds white; cultivated plants.

C. ensiformis.

Fruit 4-8 times as long as broad; seeds not white.

Plants of seashores, the stems normally prostrate; leaflets very thick and somewhat fleshy, suborbicular.....*C. maritima*.

Plants not of seashores, normally scandent over shrubs or trees, or at least ascending.

Hilum of the seed short, not more than one-fifth the circumference of the seed; native species.....*C. mexicana*.

Hilum of the seed elongate, at least one-third of the circumference of the seed and nearly as long as the seed; cultivated species....*C. gladiata*.

Canavalia bicarinata Standl. Contr. U. S. Nat. Herb. 18: 106. 1916. *Wenderothia bicarinata* Piper, Contr. U. S. Nat. Herb. 20: 578. 1925.

Santa Rosa (Chupadero, 1,500 meters, Heyde & Lux 3730). Costa Rica; Panama.

Plants scandent, the stems very slender, densely puberulent, the hairs more or less reflexed; stipules minute, subulate, deciduous; petioles as long as the leaflets; leaflets membranaceous, oval to ovate, 3-5 cm. long, acuminate, rounded at the base, densely hispidulous above, puberulent beneath; peduncles puberulent, 6-10 cm. long, about 6-flowered, with a conspicuous gland at the base of each pedicel, the bractlets broadly ovate; calyx almost 2 cm. long, sparsely strigillose, the large upper lip truncate and apiculate, the lower lip with 3 triangular acute lobes; corolla 3 cm. long, apparently purple; legume linear, densely strigillose, 10-14 cm. long, 15-18 mm. wide, each valve with 4 longitudinal costae, 1 close to each suture, one 4-6 mm. from the ventral costa, the fourth 4 mm. from the dorsal costa; seeds very dark brown, 7-8 mm. long, the hilum more than half as long as the seed, about one-fourth of its circumference.

The single Guatemalan collection known was distributed as *Phaseolus dysophyllus* Benth.

Canavalia ensiformis (L.) DC. Prodr. 2: 404. 1825. *Dolichos ensiformis* L. Sp. Pl. 725. 1753.

Believed to be a native of tropical America, but the region not known. Cultivated in tropical and warm temperate regions as a forage or manure plant, also for its edible seeds and young pods;

planted occasionally in Guatemala for forage, but a rare plant in Central America.

Plants annual, usually bushy and erect, 1-2 meters high, the tips of the branches sometimes twining, sparsely reflexed-strigillose; leaflets membranaceous, oval to ovate, 6-12 cm. long, obtuse to acute, strigillose at first but in age glabrous or nearly so; peduncles stout, 10-20-flowered, the bractlets orbicular; calyx 16 mm. long, the upper lip broad, emarginate, shorter than the tube, the lower lip 4 mm. long, 3-lobate; corolla 1.5 cm. long, pink; legume linear, slightly curved, stipitate, rostrate, 25-30 cm. long, 2-2.5 cm. wide, 12-20-seeded, each valve with 3 longitudinal costae; seeds ellipsoid, compressed, white, lustrous, about 22 mm. long and 14 mm. broad, the grayish hilum 8 mm. long.

The plant is cultivated for forage in the United States under the names "jack bean," "wonder bean," and "giant stock bean." Called "abono negro" and "chilipuca montés" (probably in error) in Salvador. Both the green pods and the dry seeds are suitable for food, and they are sometimes eaten in Central America.

Canavalia gladiata (Jacq.) DC. Prodr. 2: 404. 1825. *Dolichos gladiatus* Jacq. Coll. Bot. 2: 276. 1788. *Frijol haba*; *Haba*.

Believed to be a native of India, but known only in cultivation; planted extensively in many parts of the tropics; uncommon in Central America, but cultivated occasionally in Guatemala, for forage or more often for its edible seeds and pods; noted in Jutiapa, Chimaltenango, Suchitepéquez, and elsewhere.

Plants perennial or sometimes annual, scandent or suberect, the stems reflexed-strigillose or glabrate; petioles shorter than the leaflets, these membranaceous, broadly ovate or elliptic, mostly 10-12 cm. long, acuminate, truncate at the base, glabrous or nearly so; peduncles longer than the leaves, 10-40-flowered; calyx campanulate, 1.5-2 cm. long, strigillose, the upper lip broad, emarginate, the lower lip 3-4 mm. long, 3-lobate, the lobes triangular-ovate; corolla pale pink or purplish, 1.5-2 cm. long; legume linear, slightly curved, 20-35 cm. long, 3.5-5 cm. wide, stipitate, rostrate, strigillose at first, in age almost glabrous, each valve with 3 longitudinal costae; seeds ellipsoid, compressed, 2-3.5 cm. long, 1.5-2 cm. broad, the hilum 1.5-2 cm. long.

The English name is "sword bean." The seeds usually are dark red, but in some varieties they are ochraceous or white. As grown in Guatemala, the plant is a perennial, not flowering until the second year. The seeds are cooked and eaten, and the branches and leaves are cut for green fodder.

Canavalia hirsuta (Mart. & Gal.) Standl. Contr. U. S. Nat. Herb. 23: 495. 1922. *Wenderothia hirsuta* Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 192. 1843. *Tuché* (Huehuetenango).

Moist or wet thickets, often in oak forest, 800–2,100 meters; Alta Verapaz; Jalapa; Huehuetenango. Southern Mexico.

A large or small, somewhat woody vine, the stems very densely pilose with short spreading hairs, the pubescence of the whole plant more or less fulvous; petioles usually shorter than the leaflets, these rather thick, broadly ovate to broadly elliptic or rhombic, 3–12 cm. long, acute or acuminate, rounded or subacute at the base, conspicuously reticulate-veined, usually very densely and softly pubescent on both surfaces, almost tomentose beneath, the pubescence more or less appressed; peduncles usually short, the racemes very dense, usually many-flowered; bractlets large, orbicular; calyx very densely pilose with rather long, soft, mostly spreading hairs, 15–18 mm. long, the upper lip entire, apiculate, the lower lip 7 mm. long, the 3 lobes subequal, broadly ovate, obtuse; corolla bright rose-purple, the standard 3 cm. long; legume about 12 cm. long and 1 cm. wide, very densely velutinous-pilose, short-rostrate, the valves with 3 longitudinal costae, 1 close to each margin, the other excentric.

This is a rather handsome vine, easily recognized by the very dense pubescence on all parts and by the very dense inflorescence of large, brilliantly colored flowers.

Canavalia maritima (Aubl.) Thouars, Journ. Bot. Desv. 1: 80. 1813. *Dolichos maritimus* Aubl. Pl. Guian. 765. 1775.

On sand of seashores; Retalhuleu; San Marcos; doubtless in all the coastal departments of both coasts. Florida; Mexico; British Honduras to Panama; West Indies; South America; Old World tropics.

Stems coarse, herbaceous, often greatly elongate and rope-like, prostrate or rarely climbing over shrubs; petioles about equaling the leaflets, these thick, oval to ovate or orbicular, 5–8 cm. long, obtuse to rounded or retuse and apiculate at the apex, sparsely strigillose when young but soon glabrate; peduncles stout, somewhat longer than the leaves, 6–30-flowered; calyx campanulate, sparsely strigillose, the upper lip broad, emarginate, almost equaling the tube, the lower lip 3-dentate, the lobes triangular, obtuse; corolla pink, the standard 1–1.5 cm. long; legume linear-oblong, almost straight, 7–15 cm. long, 2–2.5 cm. wide, not much compressed, sparsely strigillose, the valves with 3 longitudinal costae, 2 of them close to the margins, the third 3–5 mm. from the ventral suture; seeds 4–9, ovoid or subglobose, 12–16 mm. long, 7–10 mm. broad, marbled with brown and fulvous, the short hilum one-fifth of the circumference of the seed.

Called “frijol del mar” in Honduras. This is one of the most common tropical strand plants, found on almost all sea beaches of Central America, often forming vast tangles of coarse stems over the sand. Usually the plants do not flower during the dry season. The species has been confused with *C. obtusifolia* (Lam.) DC., a species not found in Central America.

Canavalia mexicana Piper, Contr. U. S. Nat. Herb. 20: 569. 1925. *Frijolillo*.

Moist or wet thickets, or in hilly pine forest, 600 meters or less; Alta Verapaz; Izabal; Zacapa; Santa Rosa; Suchitepéquez; Retalhuleu; San Marcos. Southern Mexico; British Honduras; Honduras; Salvador; Nicaragua.

Plants herbaceous, or sometimes with rather thick, woody stems, scandent, the stems stout, sparsely reflexed-strigillose or glabrate; petioles shorter than the leaflets, strigillose; leaflets chartaceous, mostly oval or broadly elliptic, 5–7 cm. long or larger, subacuminate to rounded at the apex, strigillose when young but in age almost glabrous; peduncles often much elongate, many-flowered, the bractlets broadly ovate or orbicular; calyx campanulate, sparsely strigillose, 1 cm. long, the upper lip deeply emarginate, shorter than the tube, the lower lip 3-lobate, the lobes triangular, acute; corolla rose-purple, 2–2.5 cm. long; legume linear, 10–15 cm. long, strigillose when young, almost glabrous in age, each valve with 3 costae, one very near each suture, the other 3 mm. from the ventral costa; seeds ellipsoid, compressed, tawny streaked with brown, 1.5 cm. long, 1 cm. broad, the hilum oblong, black, less than half as long as the seed.

Called "haba" in Yucatan and "choncho" in Salvador.

Canavalia munda Standl. & Steyermark. Field Mus. Bot. 23: 10. 1943. *Cacaxul*; *Tacaxul*.

Moist thickets or forest, 1,300–2,500 meters; endemic, as far as known, but probably extending into Chiapas; Quezaltenango (type from Finca Pirineos, southern slopes of Volcán de Santa María, *Steyermark* 33179); San Marcos.

A large woody vine, the stems slender, terete, glabrous; petioles much shorter than the leaflets, these mostly oblong-elliptic or oblong-ovate, 8–13 cm. long, 4–6 cm. wide, acuminate or narrowly long-acuminate with an obtuse tip, rounded or obtuse at the base, long-petiolulate, glabrous, sparsely white-punctate beneath; racemes stout, very nodose, equaling or often much longer than the leaves; calyx campanulate, 10–12 mm. long, rather densely sericeous, the upper lip much shorter than the tube, emarginate, the lobes broadly rounded, the lower lip short, the 3 lobes ovate, obtuse; corolla lilac, almost 3 cm. long, the standard broad, strongly reflexed; legume 13–16 cm. long, about 3 cm. wide, densely velutinous-pilose with fuscous-brown hairs, short-stipitate, obtuse or subacute, the valves 3-costate, 2 of the costae marginal, the other 7–8 mm. from the ventral suture; seeds broadly oval, compressed, castaneous, lustrous, 12–15 mm. long, 9–12 mm. broad, the dark hilum 5 mm. long.

The foliage of this species is quite distinct from that of the others listed here, but while the differences are easy to see, they are less easy to describe.

Canavalia villosa Benth. Ann. Wien. Mus. 2: 135. 1837. *Wenderothia villosa* Piper, Contr. U. S. Nat. Herb. 20: 584. 1925.

Tacaxú; *Chorrequé real*; *Piquito de loro*; *Belencoc* (Petén, Maya); *Patillo*; *Pollita* (Alta Verapaz).

Wet to dry thickets or forest, often in pine-oak forest, 200–2,500 meters; Petén; Alta Verapaz; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Suchitepéquez; Quezaltenango; San Marcos; Huehuetenango. Mexico; British Honduras to Salvador and Panama.

A small or large vine, usually somewhat woody, the stems short-hirsute to strigillose or glabrate; petioles about as long as the leaflets, the petiolules 4–6 mm. long; leaflets oval to ovate or obovate, mostly 4–10 cm. long, thick or thin, acute or somewhat acuminate, usually rather densely or very densely strigillose or short-pilose, often somewhat tomentose beneath, rarely glabrate; peduncles mostly elongate, generally many-flowered, the bractlets ovate-orbicular, 2–3 mm. long; calyx campanulate, 12–15 mm. long, glabrous to strigillose or tomentulose, the upper lip truncate, almost equaling the tube, the lower lip 2–3 mm. long, 3-lobate; corolla purple to purple and white, pink, lavender, or almost white, the standard 3–3.5 cm. long; legume almost straight, 10–20 cm. long, 1–1.5 cm. wide, rostrate, compressed, densely tomentulose with white to ferruginous pubescence, the valves 3-costate, 1 costa near each suture, the other excentric; seeds oval, compressed, castaneous, 10 mm. long, 7 mm. broad, the hilum dark, one-eighth to one-fourth the circumference of the seed.

Called “choncho” in Salvador. The vine is common in thickets in many parts of Guatemala, especially in the central mountains. The material exhibits great variation in quality and quantity of pubescence, but there is no reason for disagreeing with Piper, who considered all the many variants as representing a single variable species.

CENTROSEMA De Candolle

Mostly scandent herbs, sometimes suffrutescent; leaves pinnately 3-foliolate, sometimes 1-foliolate, the leaflets entire, stipellate; stipules persistent, striate; flowers mostly large and showy, violaceous, bluish, pink, or whitish, the peduncles axillary, solitary or geminate, 1–several-flowered; lowest bracts stipuliform, geminate, the upper coalescent to form one striate one; pedicels 1–2 at each bract, the bractlets appressed to the calyx, striate, larger than the bracts; calyx short-campanulate, the lobes or teeth subequal, or the upper 2 connate; standard broad, explanate, somewhat calcarate dorsally near the base; wings falcate-obovate, the keel incurved, scarcely shorter than the wings; vexillar stamen free or more or less connate with the others, the anthers uniform; ovary sessile, many-ovulate; style incurved, more or less dilated at the apex, barbellate about the terminal stigma; legume sessile, linear, compressed and flat, 2-valvate, subseptate within between the seeds, both sutures somewhat thickened, the valves with a rather prominent longitudinal nerve near each margin or narrowly winged along the lower suture; seeds transverse-oblong, thick or compressed, not strophiolate, with a small hilum.

About 30 species, in tropical and temperate America. No others are known from Central America.

Leaflet only 1, cordate-sagittate at the base.....*C. sagittatum*.

Leaflets 3, obtuse or rounded at the base.

Bractlets 2-3 times as long as the calyx; leaflets blackening when dried; legume about 1 cm. wide.....*C. Plumieri*.

Bractlets equaling or shorter than the calyx; leaflets not blackening when dried; legume 4-7 mm. wide.

Leaflets linear or oblong-linear, the lateral nerves divergent at a right angle from the costa.....*C. angustifolium*.

Leaflets ovate to elliptic or oblong-lanceolate, the lateral nerves ascending.

Bracts and bractlets densely sericeous with long appressed hairs; upper calyx lobes about equaling the tube.....*C. pubescens*.

Bracts and bractlets puberulent with mostly spreading hairs; upper calyx lobes much longer than the tube.....*C. virginianum*.

Centrosema angustifolium (HBK.) Benth. Ann. Wien. Mus. 2: 117. 1837. *Clitoria angustifolia* HBK. Nov. Gen. & Sp. 6: 417. 1824. *Pirinchin*; *Frijol pirinchin* (Jutiapa).

Open grassy places, chiefly in savannas, or on brushy slopes, sometimes in wet soil, 1,200 meters or lower; Petén; Alta Verapaz; Jutiapa; Huehuetenango. Honduras; Costa Rica; Panama; northern South America.

A slender, usually small, perennial vine, glabrous throughout or nearly so; leaves long-petiolate, the stipules small, linear-lanceolate, striate, persistent; leaflets 3, linear or oblong-linear, 3.5-7 cm. long, 3-8 mm. wide, obtuse or rounded at the apex, mucronulate, obtuse at the base, subcoriaceous, reticulate-veined, the veins prominent; peduncles short and slender, the flowers solitary, slender-pedicellate; bractlets broadly ovate, striate, minutely puberulent; calyx almost 10 mm. long, the lobes very unequal, the lowest one longest, subulate; corolla blue-purple, 2 cm. long; legume linear, about 6.5 cm. long and 3 mm. wide.

Centrosema Plumieri (Turp.) Benth. Ann. Wien. Mus. 2: 118. 1837. *Clitoria Plumieri* Turp. ex Pers. Syn. Pl. 2: 303. 1807. *Chorrequé*.

Moist or wet thickets, 900 meters or less; Petén; Alta Verapaz; Izabal; Jutiapa; Santa Rosa; Escuintla; Retalhuleu; San Marcos. Southern Mexico; British Honduras to Salvador and Panama; West Indies; South America.

A small or rather large, chiefly herbaceous vine, the stems glabrous or sparsely pilose; stipules ovate, acute, striate, 4-7 mm. long; leaflets 3, ovate or rhombic-ovate, 5-12 cm. long, short-acuminate, often abruptly so, obtuse or rounded at the base, blackish when dried, glabrous or nearly so; peduncles 2-6-flowered, mostly shorter than the petioles, the bractlets broadly ovate, obtuse, multistriate, 2-3

times as long as the calyx and concealing it; calyx 6–7 mm. long, the teeth much shorter than the tube; standard white with a dark purple center, 4–5 cm. long and wide; legume 10–15 cm. long, 1 cm. wide, the margins of the valves much thickened, very long-rostrate.

Called “choncho” in Salvador; “mariposa” (Campeche); “frijolillo,” “patito” (Tabasco). The plant is common on the Pacific plains. Its flowers are large but neither showy nor handsome.

Centrosema pubescens Benth. Ann. Wien. Mus. 2: 119. 1837. *Bradburya pubescens* Kuntze, Rev. Gen. 164. 1891. *Choreque*; *Choreque de culebra*; *Choreque negro*; *Frijol cuchillo*; *Tuché* (Huehuetenango).

Moist or dry thickets or open, often rocky forest, 250–2,100 meters; Alta Verapaz; El Progreso; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Retalhuleu; Quezaltenango; Huehuetenango. Southern Mexico; Salvador; Costa Rica; Panama; West Indies; South America.

Usually a small vine, probably perennial, the stems slender, procumbent or twining, usually hispidulous; stipules ovate, acute, 2–3 mm. long; leaves long-petiolate, the 3 leaflets ovate to oblong, mostly 4–7.5 cm. long, acute, obtuse, or abruptly short-acuminate, rounded at the base, conspicuously reticulate-veined, hispidulous or glabrate above, usually densely and softly pubescent beneath; peduncles mostly longer than the petioles, few-flowered, the bractlets ovate, about equaling the calyx, densely whitish-sericeous with long hairs; standard 2–4 cm. broad, dull purple or rose-purple, sometimes whitish; legume 10–20 cm. long, 5–7 mm. wide, pubescent or glabrate, tapering to a very long, slender beak.

Called “choncho” in Salvador. A very common plant of the central mountains at middle elevations.

Centrosema sagittatum (Humb. & Bonpl.) Brandeg. ex Riley, Kew Bull. 344. 1923. *Glycine sagittata* Humb. & Bonpl. ex Willd. Enum. Pl. 757. 1809. *C. hastatum* Benth. Ann. Wien. Mus. 2: 120. 1837.

Moist or rather dry thickets or forest, 1,500 meters or less; Alta Verapaz; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu. Mexico; British Honduras; Salvador; Honduras; Costa Rica; Colombia.

Usually a small and very slender vine, the stems glabrous or essentially so; petioles narrowly or broadly winged; leaflet 1, ovate-triangular-hastate, 6–12 cm. long, acute or acuminate, deeply and openly cordate at the base, the basal lobes narrowly rounded, glabrous or nearly so, thin; peduncles about as long as the petioles, 1–few-flowered; standard 4 cm. wide; legume linear, compressed, glabrous, 8–12 cm. long, 7–8 mm. wide, terminated by a long slender beak, glabrous; seeds oval, fuscous, dull, scarcely compressed.

Called "choncho" in Salvador. A frequent small vine of the Pacific plains, flowering, apparently, only during the rainy season. The leaves are distinctive, being quite unlike those of any other Guatemalan plant.

Centrosema virginianum (L.) Benth. Ann. Wien. Mus. 2: 120. 1837. *Clitoria virginiana* L. Sp. Pl. 753. 1753. *Cuchillito*; *Patillo*; *Chorreque*; *Zapatito de la reina* (Petén, fide Lundell).

Wet to dry thickets or forest, 1,400 meters or less; Petén; Alta Verapaz; Izabal; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Chimaltenango; Retalhuleu; Huehuetenango. South-eastern United States; Mexico; British Honduras to Panama; West Indies; South America; tropical Africa.

Usually a small, very slender, herbaceous vine, perennial, twining or procumbent; stipules linear, acute; leaflets 3, ovate to lance-oblong, mostly 3–6 cm. long, obtuse to short-acuminate, rounded at the base, not very conspicuously reticulate-veined, in age usually glabrous or nearly so, when young often more or less pubescent; peduncles about equaling the petioles, few-flowered, the bractlets ovate, acute, striate, puberulent; flowers 2.5–4 cm. long; calyx small, with linear lobes, these very unequal; corolla purple to violet or almost white; legume 10–13 cm. long, 4–5 mm. wide, glabrous, tapering into a long slender beak; seeds lustrous, mottled with pale brown and blackish brown.

The Maya name of Yucatan has been recorded as "cantsin," also as "xret."

CHAETOCALYX De Candolle

Scandent herbs with slender stems; leaves odd-pinnate, the leaflets few, not stipellate; stipules lanceolate or linear; inflorescence axillary, the pedicels 1-flowered, ebracteolate, in clusters of 2–3 in the axils of stipuliform bracts, arranged in racemes, the flowers yellow; calyx teeth or lobes subequal, the 2 upper ones often approximate; standard obovate or suborbicular, emarginate, the wings oblong, free, the keel obtuse, almost straight, scarcely shorter than the standard; stamens all connate into a sheath or the vexillar one finally free, the anthers uniform; ovary short-stipitate, many-ovulate, the style filiform, incurved, the stigma small, terminal; legume linear, subterete or compressed and flat, scarcely constricted between the seeds, articulate, the joints linear to oblong or quadrate, longitudinally costate or striate; seeds transverse-oblong or orbicular-reniform, not strophiolate.

About 10 species, ranging from Mexico to southern South America. One other occurs in southern Central America and one is known from Yucatan.

Chaetocalyx belizensis Standl. Field Mus. Bot. 12: 410. 1936.

Moist thickets, 1,400 meters or lower; Alta Verapaz; Huehuetenango; San Marcos (?; material sterile). Type from river banks,

climbing over *Gynerium*, Temash River, British Honduras, W. A. Schipp 1330. Veracruz.

A slender vine, as much as 7 meters long, the stems sparsely incurved-pilous or almost glabrous, bearing a few setiform yellowish hairs with dilated bases; stipules 5 mm. long, linear-triangular, attenuate, setulose-ciliate; leaves petiolate, the rachis setulose; leaflets usually 9, very shortly petiolate, membranaceous, obovate-oval, 1.5-2 cm. long, 8-13 mm. wide, rounded or subtruncate at the apex and mucronate, obtuse at the base, black-punctulate, sparsely and minutely pilous with subappressed hairs, paler beneath; flowers fasciculate in the leaf axils, the pedicels 6 mm. long or less; calyx tubular-campanulate, the tube 5-6 mm. long, sparsely setulose with yellow hairs, the lobes 3 mm. long, filiform-attenuate from a triangular base; petals glabrous, the standard 2 cm. long; legume linear, torulose, about 13 cm. long and 1.5 mm. thick, striate, the joints numerous, minutely puberulent.

C. vestita Standl. of Yucatan, similar to *C. belizensis* but with densely pilous leaflets and a densely pubescent standard, is to be expected in northern Petén.

CICER L. Chick pea

Herbs, usually annual, with viscid pubescence; leaves pinnate, the petiole bearing a short tendril at the apex or spinescent, the leaflets small, dentate, not stipellate; stipules foliaceous, oblique, usually dentate; flowers small, white to violaceous, solitary or few and pedicellate on axillary peduncles, the bracts small; bractlets none; calyx tube oblique or gibbous posteriorly, the lobes subequal or the 2 upper ones shorter; standard ovate or suborbicular, unguiculate; keel rather broad, incurved, obtuse or subacute; vexillar stamen free, the others connate, the filaments dilated above, the anthers uniform; ovary sessile, 2-many-ovulate, the style filiform, incurved, not barbellate, the stigma terminal; legume sessile, ovoid or oblong, turgid and often inflated, 2-valvate; seeds subglobose or obovoid, with a small hilum; cotyledons large and thick, the radicle short, slightly incurved or almost straight.

About 10 species, native of the Mediterranean region and of Asia.

Cicer arietinum L. Sp. Pl. 738. 1753. *Garbanzo*.

Native of the eastern Mediterranean region, but apparently unknown in a wild state; cultivated for its edible seeds in many parts of the earth, chiefly in warm-temperate regions; planted commonly in Guatemala, mostly in the central mountains at middle or rather high elevations.

Plants slender, erect or nearly so, 20-50 cm. high, simple or branched, the stems and leaves glandular-pilous with weak spreading hairs; leaflets mostly 5-7 pairs, obovate to oblong-elliptic, 7-19 mm. long, obtuse, serrate; stipules half as large as the leaflets, serrate; peduncles 1-flowered, the flowers 10-12 mm. long, reflexed in age; calyx 9 mm. long; corolla violet to lilac or white; legume inflated

and rounded or rhombic-oval, 2-3 cm. long, 1.5 cm. broad, viscid-pilose; seeds 1-2 and 5-14 mm. long, usually whitish.

Chick peas are little known or grown in the United States, although they can be purchased in the cities and are eaten by immigrants from the Mediterranean countries. In Spain *garbanzo* is the most common of leguminous foods, and one of the most important vegetable foods of the country. *Garbanzo* is much grown in Mexico and Guatemala, but is not very common farther south, probably because conditions are not so favorable for its cultivation. The plants yield heavily, and it is reported that under favorable conditions, as in some parts of the United States, 500-1,000 pounds per acre may be produced. The Guatemalan production of *garbanzo* for the year 1938-39 is reported as 111,000 pounds, most of which came from Sololá, Sacatepéquez, and Guatemala. The seeds are eaten cooked, usually boiled with some kind of meat, or in soup, and they are a common dish upon Guatemalan tables, both in homes and public eating places. Cooked alone they are quite as insipid and flavorless as ordinary white beans, and they are also somewhat indigestible. The plants are cultivated during the *invierno*, and are seldom seen anywhere during the dry months.

CLIMACORACHIS Hemsley & Rose

Slender annuals with the habit and general appearance of *Aeschynomene*, simple or branched; leaves pinnate, the leaflets small, numerous, oblong-linear, acute, conspicuously palmate-nerved, entire, subfalcate at the apex; stipules narrow, persistent, striate-nerved, conspicuously produced below the point of attachment; inflorescence axillary, the peduncles few-flowered, the rachis often elongate and zigzag, the bracts and bractlets ovate or lanceolate, striate-nerved, viscid-ciliate; calyx striate-nerved, deeply bilabiate, the lower lip slightly longer; standard suborbicular, the keel shorter than the wings, obtuse; anthers uniform; ovary stipitate, few-ovulate; legume oblong or linear-oblong, few-seeded, compressed, bivalvate, the upper suture straight or nearly so, the lower straight or somewhat constricted between the seeds, the valves at length separating from the thickened margin, viscid-setulose.

Three species, the others in western Mexico (Jalisco). The genus is close to *Aeschynomene*, but apparently sufficiently distinct in the continuous, not articulate valves of the fruit. Each of the three species is known at present, apparently, from a single locality.

Climacorachis guatemalensis Standl. & Steyermark. Field Mus. Bot. 23: 11. 1943.

Pine-oak forest, about 1,800 meters; Huehuetenango (type from Río Pucal, 14 km. south of Huehuetenango, *Standley* 82330).

A slender annual 80 cm. high or less, erect, simple or sparsely branched, sometimes suffrutescent at the base, glabrous or essentially so except in the inflorescence; stipules narrow, 1 cm. long, attached at the middle; leaflets about 20 pairs, 6-8 mm. long, 1.5 mm. wide, obliquely acute, pale beneath, conspicuously 3-nerved for their whole length, sessile; racemes few-flowered, equaling or longer than the leaves, the rachis slender and flexuous, viscid-setulose, the pedicels long and slender; bracts ovate, setulose-ciliate; flowers not seen, the persistent calyx 3 mm. long, viscid-setulose; legume oblong, 1.5-2 cm. long, 5-7 mm. wide, little compressed, obliquely rounded or truncate at the apex, rather densely viscid-setulose, the hairs with dilated blackish bases; valves separating from the margin; seeds globose, 2 mm. in diameter, dull, blackish olivaceous.

Only a few plants were found at the type locality, but they may be more plentiful during the rainy season. While the fruits normally have continuous valves, in a few cases one joint is constricted at the base from the larger continuous terminal portion.

CLITORIA L.

Herbs or shrubs, erect, scandent, or procumbent; leaves pinnate, usually with 3 but sometimes with more numerous leaflets, generally stipellate; stipules persistent, striate; flowers large and showy, blue to white or purple, solitary or fasciculate in the leaf axils or short-racemose; bracts persistent, stipuliform, geminate, the lower ones opposite, the upper connate to form a single one; bractlets mostly larger than the bracts, persistent, striate; calyx tubular, the 2 upper lobes subconnate, the lowest one narrower than the others; standard large, erect, emarginate, narrowed at the base, not appendaged; wings falcate-oblong, adherent to the middle of the keel, the keel shorter than the wings, incurved, acute; vexillar stamen free or connate with the others, the anthers uniform; ovary stipitate, with numerous ovules, the style elongate, incurved, more or less dilated at the apex, barbellate along the inner side; legume stipitate, linear, more or less compressed, the upper or both sutures somewhat thickened, the valves plane or convex, naked or longitudinally costate, 2-valvate, interrupted or continuous within; seeds subglobose or compressed, not strophiolate.

Species about 30, in the tropics of both hemispheres. Two other species are known from southern Central America.

Leaflets 5-7; flowers bright blue. *C. ternatea*.
 Leaflets 3; flowers not blue.

Leaves almost sessile; leaflets linear-oblong to almost linear, obtuse or rounded at the apex. *C. guyanensis*.

Leaves long-petiolate; leaflets oblong-ovate to elliptic or oval, often acute or subacuminate.

Legume with a longitudinal costa on each valve midway between the sutures; leaflets mostly very obtuse or rounded at the apex, usually very densely pilose beneath. *C. rubiginosa*.

Legume not costate; leaflets acute or acuminate, usually very sparsely pilose beneath.

Plants scandent; standard 3.5 cm. long; legume glabrous . . . *C. mexicana*.

Plants erect or nearly so; standard 2.5 cm. long; legume thinly strigose.
C. polystachya.

Clitoria guyanensis (Aubl.) Benth. Journ. Linn. Soc. 2: 40. 1858. *Crotalaria guyanensis* Aubl. Pl. Guian. 761. pl. 305. 1775. *Hierba de Mayo*.

In grassland, 300 meters or less; Petén. British Honduras; Honduras; Colombia to Brazil.

An erect perennial herb, 30 cm. high or less, the stems one or more from a woody root, stiff, simple or branched, laxly pilose or glabrate; petioles usually less than 1 cm. long, often almost none; stipules rigid, subulate; leaflets 3, linear-oblong or almost linear, mostly 3–8 cm. long and about 1 cm. wide, rounded or very obtuse at the apex, mucronate, glabrous above, sparsely pilose and pale beneath, subcoriaceous, the venation prominent and closely reticulate on both surfaces; peduncles rigid, longer than the petioles, 2-flowered; calyx 2.5–3 cm. long, glabrous or pilose; standard blue, about 5.5 cm. long; legume stipitate, subfalcate, 2.5–7 cm. long, the valves convex, each with a median longitudinal costa.

This is said to be one of the most conspicuous and large-flowered herbaceous plants of the Petén savannas. It flowers in May, after the rainy season begins, hence the local name.

Clitoria mexicana Link, Enum. Pl. 2: 235. 1822. Chiefly in rather dry, oak or pine forest, 1,000–2,000 meters; Zacapa; Chiquimula; Jalapa; Sololá; Huehuetenango. Southern Mexico.

A slender vine, herbaceous or suffrutescent, the stems sparsely short-pilose; stipules lance-oblong, 6–8 mm. long; leaves long-petiolate, the 3 leaflets mostly ovate-oblong or ovate, thin, 4–7 cm. long, acute or acuminate, glabrous above, pale beneath, sparsely short-pilose on the nerves and veins; peduncles slender, equaling or shorter than the leaves, few-flowered, the bracts stipuliform, striate-nerved; calyx 1.5 cm. long or slightly longer, sparsely pilose, the lobes lanceolate, attenuate-acuminate; corolla white, the standard with purplish stripes, about 3.5 cm. long; legume glabrous, 3.5–5.5 cm. long, 6 mm. wide, the valves not costate.

This is perhaps the plant that has been reported from Guatemala as *C. mariana* L.

Clitoria polystachya Benth. Pl. Hartweg. 60. 1840. *C. multiflora* Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 188. 1843. *Vainilla*.

Rocky wooded slopes, usually in pine forest, 800–2,200 meters; Zacapa; Chiquimula; Sololá; Huehuetenango. Southern Mexico; Honduras; Salvador.

An erect shrub 2 meters high or lower, simple or branched, the young branches pilosulous or glabrate; leaves long-petiolate, the 3 leaflets lance-oblong or ovate-oblong, mostly 7–14 cm. long, long-acuminate, glabrous above or nearly so, densely pilose beneath with short subappressed hairs; peduncles mostly much shorter than the petioles, densely several-many-flowered; calyx 1 cm. long, glabrous or very sparsely pilose; petals white tinged with purple, the standard 2.5 cm. long; legume scarcely compressed, 2–3 cm. long, sparsely strigose, 7–8 mm. wide, stipi-

tate, acute and rostrate, the valves rather thick, not costate; seeds brown or light brown, oval, lustrous.

Called "chapelno" in Salvador, perhaps in error, since that name belongs more properly to the genus *Lonchocarpus*.

Clitoria rubiginosa Juss. ex Pers. Syn. Pl. 2: 303. 1807. *C. glycinoides* DC. Prodr. 2: 234. 1825.

Savannas, pine forest, or moist or dry thickets, 1,050 meters or less; Alta Verapaz; Izabal; Suchitepéquez; Retalhuleu. Southern Mexico; British Honduras; Panama; West Indies; South America.

A small slender vine, the stems densely pilose with long spreading fulvous hairs; stipules ovate, striate-nerved, acute, 4–7 mm. long; leaves long-petiolate, the 3 leaflets ovate-oblong or oval-oblong, 4–10 cm. long, obtuse or subacute, rounded at the base, glabrous and green above, paler beneath, densely pilose with rather long, soft, spreading hairs; peduncles equaling or longer than the petioles, 1–3-flowered, the bracts and bractlets ovate; calyx long-pilose, 2–3.5 cm. long, the lobes acuminate, half as long as the tube; standard white with a dark center and purple or crimson veins, 5 cm. long; legume stipitate, linear-oblong, 3–4.5 cm. long, 8 mm. wide, glabrous, the valves thick, convex, each with a prominent longitudinal median costa; seeds globose, viscid, 3 mm. in diameter.

Clitoria ternatea L. Sp. Pl. 753. 1753. *Diego; Concha blanca* (Petén).

Probably native of tropical Africa, but cultivated widely for ornament in tropical America, and sometimes escaping; planted occasionally for ornament in Guatemala, chiefly in the lowlands.

A slender herbaceous vine, almost glabrous but sparsely pubescent on the younger parts; stipules linear-lanceolate, acuminate, 5–8 mm. long; leaves petiolate, pinnate, the leaflets usually 5–7, broadly elliptic to rounded, 2–4.5 cm. long, rounded at each end, glabrous and green above, pale beneath and glabrate; peduncles 1–2 cm. long, 1-flowered, the bracts ovate-orbicular, obtuse; calyx 2 cm. long, pale green, glabrous; standard 3–5 cm. long, blue with a white center; legume subsessile, flat, 13 cm. long or less, 1 cm. wide, rostrate, sparsely pilose; seeds compressed, subreniform, mottled, 5–6 mm. long.

Called "zapatilla de la reina" in Salvador. This is an exceedingly handsome vine because of its large, clear royal-blue flowers. It well deserves more extensive cultivation, for it thrives with little care and soon covers a large trellis or shrub.

COLOGANIA Kunth

Perennial herbs, scandent or prostrate, sometimes erect; leaves pinnately 3-foliolate, sometimes 1-foliolate, stipellate; stipules small, often striate; flowers purple or violet, axillary, solitary, fasciculate, or in short racemes, the bracts

and bractlets persistent, lanceolate and striate or linear or setaceous; calyx tubular, the 2 upper teeth or lobes connate for part or all their length, the lower lobe longer; standard obovate, narrowed to a claw, erect, its sides reflexed; wings oblique-oblong, slightly adherent to the keel; keel shorter than the wings, scarcely incurved, obtuse; vexillar stamen free, the others connate, the anthers uniform or the alternate ones slightly smaller; ovary stipitate, with few-many ovules, the style incurved, short-subulate, not barbellate, the stigma terminal, capitate; legume linear, compressed, straight or incurved, 2-valvate, subseptate within between the seeds; seeds compressed, orbicular or subquadrate, not strophiolate, the hilum oblong.

Perhaps 20 species, chiefly in mountain regions, southwestern United States to the Andes of South America. Probably one other species occurs in southern Central America.

Leaflet 1.....*C. procumbens*.

Leaflets 3.

Calyx sparsely strigose.....*C. glabrior*.

Calyx pilose with spreading hairs.....*C. rufescens*.

Cologania glabrior Rose, Contr. U. S. Nat. Herb. 8: 38. 1903.
C. pulchella f. *glabrior* Micheli ex Donn. Smith, Enum. Pl. Guat. 4: 36. 1895, nomen. *Pegapega*.

Moist thickets or open pine forest, 1,000–2,400 meters; Chiquimula; Santa Rosa (type from Laguna de Ayarza, *Heyde & Lux* 3743); Escuintla; Chimaltenango; Huehuetenango. Chiapas.

A slender vine, twining about grasses and other small plants, the stems retrorse-pilose; leaves small, long-petiolate, the 3 leaflets short-petiolulate, mostly ovate or broadly ovate, 3–6 cm. long, rarely oblong, acute or rarely obtuse, green above and thinly hispidulous, slightly paler beneath and strigose, conspicuously and closely reticulate-veined, thin; flowers geminate in the leaf axils, slender-pedicellate; calyx 8–10 mm. long, sparsely strigose, the lobes short, acuminate; corolla 2–2.5 cm. long, violet.

The proper name for this species is uncertain and can not be determined satisfactorily until the whole genus is intelligently monographed. Central American material of this and related species has been referred generally to *C. pulchella* HBK., described from Michoacán; of that we have seen no authentic representation, but if Kunth's original description is accurate, the Guatemalan plant is distinct. It can be stated definitely that the plant here described is *C. glabrior* Rose, but it remains to be decided whether some earlier name can be found for the species.

Cologania procumbens Kunth, Mimos. 205. pl. 57. 1819.
Frijolillo.

Chiefly in open, pine or oak forest, sometimes on moist brushy hillsides, 1,000–2,000 meters; Zacapa; Jalapa; Santa Rosa; Guatemala; Chimaltenango; Sololá; Quiché; Huehuetenango. Southern Mexico; Honduras; Panama; northwestern South America.

Plants perennial from a thick hard root, simple or branched, erect or somewhat twining, the slender wiry stems reflexed-pilose; stipules small, subulate; leaflet 1, on a short petiole, almost linear to elliptic-oblong, 3.5–8 cm. long, obtuse or acute, obtuse or rounded at the base, subcoriaceous, glabrous or nearly so, conspicuously reticulate-veined; flowers 2–3-fasciculate, short-pedicellate; calyx green, 8 mm. long, strigose, with short broad teeth; petals purple, the standard 2 cm. long, glabrous; legume linear, slightly curved, about 3.5 cm. long and 3 mm. wide, strigose.

Although widely scattered in the mountains of Guatemala, this plant is seldom if ever plentiful. It is noteworthy for the often great variation in leaf form upon an individual plant. It has been reported from Guatemala as *Galactia marginalis* Benth.

Cologania rufescens Rose, Contr. U. S. Nat. Herb. 8: 38. 1903.
Chorrique de montaña.

Open forest or moist thickets, 350–2,800 meters; Zacapa; Jalapa; Guatemala; Quiché (type from Chiul, *Heyde & Lux* 4460); Huehuetenango. Honduras.

A small slender twining herb, the stems hirsute with somewhat reflexed, fulvous hairs; leaves long-petiolate, the 3 leaflets ovate to oval, 2.5–4.5 cm. long, acute and apiculate to rounded at the apex, rounded at the base, rather thin, green above and appressed-pilose, somewhat paler beneath, densely pilose with subappressed hairs; flowers geminate, on short slender pedicels; calyx 8–10 mm. long, densely pilose with long spreading fulvous hairs, the lobes short, unequal, subulate-acuminate; corolla violet or purple, the standard 2 cm. long, glabrous.

This may be no more than a variant of *C. glabrior*.

COURSEZIA De Candolle

Unarmed shrubs or trees; leaves odd-pinnate or abruptly pinnate, the leaflets numerous, entire, petiolulate; stipules subulate, persistent, sometimes spinescent; flowers rather small, racemose, axillary, the bracts small, deciduous; calyx campanulate or turbinate, about as broad as high, the lobes subequal, the upper 2 often united for part of their length; corolla white to ochroleucous or purplish, the petals subequal, or the wings shorter; standard suborbicular, short-unguiculate; wings obliquely oblanceolate or oblong, the keel obtuse or acute; stamens diadelphous; style inflexed at the base, barbellate above along the inner side; legume linear, 2-valvate, compressed, not septate, usually constricted between the seeds and more or less torulose, sessile or short-stipitate, the lower portion often narrow and empty; seeds suborbicular, compressed, not strophiolate.

About 15 species, distributed from Texas to Brazil. Only one is known from Central America.

Coursetia polyphylla Brandeg. Univ. Calif. Publ. Bot. 4: 376. 1913.

Brushy rocky hillsides, 400–700 meters; Zacapa; Chiquimula. Veracruz and Oaxaca.

A shrub or small tree 3–5 meters high, the branchlets glabrous or at first sparsely strigose; stipules subulate, erect, 2 mm. long; leaves odd-pinnate, the leaflets 9–13, elliptic, rounded or retuse at the apex, obtuse to subacute at the base, 1.5–4.5 cm. long, 1–2 cm. wide, green and glabrous above, paler beneath, sparsely strigose, reticulate-veined; racemes shorter than the leaves, several-flowered; calyx pubescent, the tube 2 mm. long, the teeth triangular; corolla 8 mm. long, ochroleucous, tinged with reddish; legume about 6 cm. long and 5 mm. wide, 2–6-seeded, brown, glabrous, lustrous, strongly constricted between the remote seeds; seeds brown, dull, suborbicular, 3 mm. broad.

The shrub is plentiful on the dry rocky hills along the divide on the road between Zacapa and Chiquimula.

CRACCA Benth

Perennial herbs or small slender shrubs, the stems sometimes suffrutescent; leaves odd-pinnate, stipellate; flowers small and inconspicuous, in axillary racemes, the bracts subulate or setaceous, caducous; calyx campanulate, the 5 lobes subequal, subulate-acuminate; corolla whitish or pale yellowish, the petals subequal, the standard orbicular or reniform, unguiculate, with reflexed margins; wings oblong, unguiculate, free, the keel obovate, acute or acuminate, its petals united to the apex; stamens diadelphous; ovary sessile, many-ovulate, the style inflexed, longitudinally barbellate above, the stigma capitate; legume linear, compressed, 2-valvate, impressed between the seeds, septate within; seeds subquadrate, not strophiolate.

About 12 species, in tropical and warm-temperate America. One or two other species may occur in southern Central America. The generic name *Cracca* Benth has been conserved. *Cracca* L. is congeneric with *Tephrosia*. It is most unfortunate that the name *Cracca* should be used for the present group, known in recent years by the name *Benthamantha* Alef., since its use thus will result in much confusion, at least in herbaria. Since the group is a small one, of no economic or other interest, the name used for it is a matter of little importance.

Plants low, herbaceous, usually decumbent or procumbent, mostly 30 cm. high or less; corolla small, 6–8 mm. long.

Leaflets usually 11–15.....*C. pumila*.

Leaflets 3–9.

- Leaflets glabrous on the upper surface.....*C. Greenmanii*.
 Leaflets appressed-pilose on the upper surface.....*C. glandulosa*.
 Plants erect, sometimes a meter high, often frutescent.
 Legume glabrous.....*C. ochroleuca*.
 Legume pubescent, often minutely so.
 Pubescence of the young branches closely appressed.....*C. aletes*.
 Pubescence of the young branches spreading, or at least not appressed.
 Inflorescence glandular-pilose.....*C. bicolor*.
 Inflorescence without glandular pubescence.....*C. mollis*.

***Cracca aletes* Standl. & Steyerl., nom. nov. *Benthamantha Brandegei* Rydb. N. Amer. Fl. 24: 246. 1924, not *Cracca Brandegei* Standl. 1919.**

Moist or dry thickets, 900 meters or less; Jutiapa; Santa Rosa; Escuintla; Retalhuleu. Western Mexico; Salvador; Costa Rica.

A slender shrub about a meter high, the stems often weak and reclining, sparsely appressed-pilose with whitish hairs, soon glabrate; stipules setaceous, 5-8 mm. long; leaflets 9-13, elliptic to oblong, mostly 1-4 cm. long, rounded or obtuse at the apex, short-mucronate, sparsely or densely strigose, somewhat paler beneath; racemes commonly 6-12-flowered, pilose with mostly eglandular hairs; calyx pilose, the narrow lobes longer than the tube; corolla ochroleucous or the standard purplish, 7 mm. long; legume 6-8 cm. long, 3 mm. wide, puberulent, with 25 or often much fewer seeds.

Called "frijolillo" in Salvador.

***Cracca bicolor* Micheli, Bull. Herb. Boiss. 2: 444. 1894. *Benthamantha bicolor* Rose, Contr. U. S. Nat. Herb. 10: 99. pl. 11. 1906.**

Moist or dry thickets, 1,800 meters or less; Chiquimula; Santa Rosa; Escuintla; Retalhuleu; Quiché (type from Cunén, *Heyde & Lux* 3305).

A slender shrub, erect or nearly so, a meter high or less, the stems pilose with short spreading hairs, sometimes densely so; stipules subulate-setaceous, 6-8 mm. long; leaflets 11-13, oval to oval-oblong, 1-3.5 cm. long, rounded at each end, mucronate, sparsely or densely appressed-pilose on both surfaces; racemes often much longer than the leaves, mostly 4-8-flowered, the bracts lance-subulate, 3 mm. long; calyx appressed-pilose, the narrow lobes twice as long as the tube; corolla 9 mm. long, ochroleucous with copper-colored streaks; legume 4-5.5 cm. long, 2.5-3 mm. wide, puberulent.

***Cracca glandulosa* (Rose) Standl. & Steyerl., comb. nov. *Benthamantha glandulosa* Rose, Contr. U. S. Nat. Herb. 10: 99. 1906. *Frijolillo*.**

Dry or moist thickets or open banks, 200-1,500 meters; Zacapa; Jalapa; Jutiapa; Santa Rosa (type from Casilla, *Heyde & Lux* 3301); Guatemala; perhaps endemic.

A herbaceous perennial, erect or decumbent, 30 cm. high or less, branched, the roots thickened and often forming small tubers, the stems sparsely short-pilose; stipules subulate-setaceous, 2-3 mm. long; leaflets 5-7, elliptic to oval or obovate, mostly 1-2 cm. long, rounded at each end, thin, pilose on both surfaces; racemes usually much longer than the leaves, glandular-pilose, few-flowered, the bracts setaceous, 3 mm. long; calyx viscid-pilose, the lobes twice as long as the tube, attenuate-acuminate; corolla ochroleucous, 8 mm. long; legume glabrous, about 4 cm. long and 2.5 mm. wide.

This was once reported from Guatemala as *C. mollis* Benth. & Oerst.

Cracca Greenmanii Millsp. Field Mus. Bot. 1: 299. 1896.
Benthamantha Greenmanii Britten & Baker ex Millsp. Field Mus. Bot. 2: 50. 1900. *Pegapecta*.

In rock crevices or in rather dry thickets or forest, 200-600 meters; Zacapa; Chiquimula. Yucatan and Campeche; British Honduras.

A low perennial herb, 30 cm. high or less, erect or decumbent, branched, the roots bearing small fusiform tubers, the stems sparsely strigose or glabrate; stipules subulate, 2 mm. long; leaflets 3-5, obovate to oval or rounded-ovate, 1-3 cm. long, obtuse or retuse at the apex, mucronate, glabrous above, sparsely or rather densely strigose beneath; racemes few-flowered, the rachis glandular-pubescent; calyx strigose, the lobes somewhat longer than the tube; corolla cream-colored, about 1 cm. long; legume glabrous, about 4.5 cm. long and 2.5 mm. wide.

Called "jicama de conejo" in Yucatan; the Maya names are recorded as "chicamthul" and "xholac." One Guatemalan specimen, from Zacapa, is noteworthy in being white-tomentose on some parts of the stem and leaf rachis. At first it was believed that it represented a distinct species, but a similar plant is found on a sheet of *C. Greenmannii* from Yucatan, mounted with two plants having the more common type of pubescence. It is believed, therefore, that this variation is not systematically significant.

Cracca mollis (HBK.) Benth. & Oerst. Vid. Medd. 9. 1853.
Tephrosia mollis HBK. Nov. Gen. & Sp. 6: 463. 1823. *Benthamantha mollis* Alef. Bonplandia 10: 264. 1862.

Dry or moist thickets or open rocky hillsides, 150-2,000 meters; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Sacatepéquez; Huehuetenango. Southern Mexico; Honduras; Costa Rica; northeastern South America.

An erect shrub a meter high or less, or the stems sometimes weak and reclining on other plants, pilose with short spreading hairs, at least on the younger parts; stipules setaceous, 4-8 mm. long; leaflets 7-13, elliptic or oval, 1-4 cm. long,

rounded at each end, mucronate, appressed-pilose on both surfaces, often densely sericeous; racemes longer than the leaves, 5-10-flowered, densely pilose with eglandular hairs; calyx sericeous, the lobes twice as long as the tube, lance-subulate; corolla 9 mm. long, pale yellowish or whitish, the standard often tinged with purple; legume 4-6 cm. long, 3 mm. wide, puberulent, 20-25-seeded.

It is probably this species that has been reported from Guatemala as *C. caribaea* (Jacq.) Benth., a species recorded from Panama and occurring in the West Indies, distinguished by having substantially larger flowers. The Guatemalan material referred here has somewhat smaller flowers than the South American plant and was treated by Rydberg as a distinct species, *Cracca micrantha* Micheli, whose type came from Costa Rica, but is scarcely worthy of varietal recognition. Rydberg's key is erroneous in separating *C. micrantha* on its appressed pubescence, since the hairs of the younger parts are spreading and not at all appressed.

Cracca ochroleuca (Jacq.) Benth. & Oerst. Vid. Medd. 9. 1853.
Galega ochroleuca Jacq. Icon. Pl. Rar. 1: 15. 1786. *Benthamantha ochroleuca* Alef. Bonplandia 10: 264. 1862.

Moist or dry thickets, often on rocky slopes or in thin forest, frequently in hedges, 200-2,300 meters; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez; Huehuetenango. Honduras; Panama; southward to Peru.

A slender shrub about a meter high, erect or leaning on other shrubs, the stems short-pilose or glabrate; stipules subulate, 8-10 mm. long; leaflets 5-7 or sometimes more numerous, oval or ovate, 1-3 cm. long, thin, appressed-pilose on both surfaces, somewhat paler beneath; racemes longer than the leaves, few-flowered, the flowers often remote; calyx pilose, the subulate lobes twice as long as the tube; corolla 1 cm. long, ochroleucous, tinged with dark red on the standard; legume glabrous, 3-7 cm. long, 3 mm. wide, about 12-15-seeded.

Cracca pumila (Rose) M. E. Jones, Contr. West. Bot. 18: 44. 1933. *Benthamantha pumila* Rose, Contr. U. S. Nat. Herb. 10: 99. pl. 30. 1906.

In thickets, 1,400-1,600 meters; Jalapa (base of Volcán de Jumay, Steyermark 32290). Southern Mexico.

A perennial herb with somewhat woody, fusiform roots, the stems herbaceous or chiefly so, 20-30 cm. high, sparsely strigose; stipules subulate, 3 mm. long; leaflets 11-15, oblong to oval, 1-2 cm. long, rounded at each end, mucronate, glabrous above, sparsely appressed-pilose beneath; racemes longer than the leaves, 3-6-flowered, pilose with eglandular hairs; calyx pilose, the lobes longer than the tube, lance-acuminate; corolla 6 mm. long, ochroleucous, the banner with purple veins; legume 4-5.5 cm. long, 3 mm. wide, glabrous or nearly so, 12-15-seeded.

CROTALARIA L.

Reference: Harold A. Senn, The North American species of *Crotalaria*, *Rhodora* 41: 317-367. 1939.

Herbs or shrubs; leaves simple or digitately 3-foliate; stipules free from the petiole, sometimes decurrent on the stems, often small or none; flowers generally yellow, rarely blue or purplish, racemose or occasionally solitary, the racemes terminal or opposite the leaves, the bracts usually small or none; bractlets inserted on the pedicel or calyx, rarely none; calyx lobes free or the calyx rarely bilabiate; standard orbicular, short-unguiculate, the wings obovate or oblong, shorter than the standard; keel incurved, rostrate; stamens connate into a cleft sheath, the alternate anthers small and versatile, the others long and basifixed; ovary normally sessile, 2-many-ovulate; style incurved or abruptly inflexed above the ovary, barbellate above along the inner side; legume globose or oblong, turgid or inflated, bivalvate, continuous within; seeds not strophiolate, on filiform funicles.

More than 200 species, in both hemispheres, chiefly in tropical regions. Probably all the Central American species are enumerated here.

Leaves all simple.

Corolla blue; stipules semiorbicular, not decurrent on the stems . . . *C. verrucosa*.

Corolla partly or wholly yellow, never blue; stipules narrow.

Stipules, when present, not decurrent on the stems.

Leaves broadest above the middle, glabrous on the upper surface; calyx lobes ovate . . . *C. retusa*.

Leaves broadest at or near the middle, pilose on the upper surface; calyx lobes linear or lanceolate . . . *C. nitens*.

Stipules, when present, decurrent on the stems.

Pubescence of the stems and leaves closely appressed, strigose or sericeous. *C. Purshii*.

Pubescence of the stems and leaves spreading, hirsute.

Plants decumbent, perennial; leaves ovate, elliptic, or orbicular; stipules small or none; racemes usually 3-6-flowered . . . *C. angulata*.

Plants mostly erect, annual or perennial; leaves narrowly ovate to linear; stipules usually present, triangular, decurrent on the stem; racemes 2-4-flowered.

Plants usually annual; leaves narrowly ovate or lance-ovate; bracts narrowly lanceolate, sessile; corolla about equaling the calyx.

C. Tuerckheimii.

Plants annual or perennial; leaves lanceolate to linear; bracts ovate-lanceolate, slender-stalked; corolla usually longer than the calyx.

C. sagittalis.

Leaves all or mostly 3-foliate.

Legume pilose or hirsute with spreading hairs.

Petiole longer than the terminal leaflet; leaflets rounded-obovate, almost as broad as long, broadly rounded or retuse at the apex . . . *C. incana*.

Petiole equaling or often much shorter than the terminal leaflet; leaflets mostly elliptic-oblong, more than twice as long as broad . . . *C. mollicula*.

Legume with closely appressed pubescence, or sometimes glabrous.

Leaflets small, mostly 1-3 cm. long, rounded at the apex; legume small, 2.5 cm. long or shorter.

Flowers 1 cm. long or shorter; standard strigose outside at the apex; plants annual, usually low and less than a meter high. *C. pumila*.

Flowers more than 1 cm. long; standard glabrous or nearly so; plants tall, mostly more than 1 meter high, often suffrutescent. *C. longirostrata*.

Leaflets large, mostly 3-7 cm. long, often acute or merely obtuse at the apex, sometimes rounded; legume small or large, often more than 2.5 cm. long.

Lobes of the calyx little if at all longer than the tube; leaflets elliptic to rounded-obovate, usually rounded at the apex. *C. mucronata*.

Lobes of the calyx much longer than the tube; leaflets either acute or subacute or else narrowly oblong or lance-oblong.

Petiole equaling or usually longer than the terminal leaflet; leaflets mostly ovate-elliptic and 2-3 cm. wide; racemes chiefly opposite the leaves.

C. vitellina.

Petiole shorter than the terminal leaflet, usually much shorter; leaflets narrowly oblong or lance-oblong, mostly 1 cm. wide or narrower; racemes terminal. *C. maypurensis*.

Crotalaria angulata Mill. Gard. Dict. ed. 8. No. 9. 1768.
C. rotundifolia Poir. Encycl. Suppl. 2: 402. 1811. *C. ovalis* Pursh,
Fl. Amer. Sept. 469. 1814. *Chinchín*; *Chipilín de monte*.

Brushy slopes or open banks, open fields, gravel banks along streams, often in pine or oak forest, 200-2,400 meters; Alta Verapaz; El Progreso; Zacapa; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Huehuetenango; San Marcos. Southeastern United States; Mexico.

Plants usually perennial, decumbent or suberect, commonly 15 cm. high or lower, usually much branched from the base, the stems densely short-hirsute with spreading fulvous hairs; stipules very small or none, not decurrent; leaves subsessile, oval to oblong, 1-3 cm. long, obtuse or rounded at the apex, densely pilose with lax, usually spreading, rather harsh hairs; racemes mostly 3-6-flowered; flowers 7 mm. long, the calyx hirsutulous, deeply lobate, the lobes narrow, acute, much longer than the tube; corolla yellow, little exceeding the calyx, the standard glabrous; legume about 18 mm. long and 7-8 mm. broad, rounded at each end, glabrous.

It is decidedly questionable whether this is more than a form or variety of the widespread *C. sagittalis*. In this group Senn has recognized five species, whose characters, as presented in his key to species, are far from convincing, especially when these characters, never clearly cut, are further complicated by various varieties that can not be traced in his key to the species to which he refers them. His species are maintained here, but with very little faith in their validity. Other botanists who have attempted to segregate species in this group of *Crotalaria* have done no better, and probably no

worse. The group is one in which probably it never will be possible to agree upon satisfactory classification.

Crotalaria incana L. Sp. Pl. 716. 1753. *C. setifera* DC. Prodr. 2: 131. 1825. *Chipilín*; *Chipilín de culebra*; *Chipilín de monte*; *Chinchín*; *Chipilín de coyote*.

Wet to dry thickets or fields, common in waste ground, often in cultivated fields or on sandbars, sometimes in open rocky places, 2,100 meters or less; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Huehuetenango; Quezaltenango. Southeastern United States; Mexico; British Honduras to Salvador and Panama; West Indies; South America; Old World tropics.

An erect annual, commonly a meter high or less, branched above, the stems, petioles, and racemes commonly hirsute with long spreading brownish hairs; stipules subulate, 5 mm. long or less, not decurrent, often wanting; leaves long-petiolate, the 3 leaflets broadly obovate to obovate-orbicular, 1-5 cm. long, rounded at the apex, thin, glabrous above, paler beneath and long-pilose along the costa; racemes terminal or opposite the leaves, mostly few-flowered; calyx 7-9 mm. long, lobate almost to the base, very sparsely pilose with spreading hairs; corolla bright yellow or greenish yellow, 10-13 mm. long, the standard glabrous; legume pendulous, 2-3.5 cm. long, 1 cm. broad, densely pilose with very long, fulvous, spreading hairs.

In Salvador sometimes called "chinchín," "chipilín macho," "chipilín de venado," and "chipilín de zope"; the Maya name of Yucatan is "sacpet." This species is not used as a pot herb, at least not commonly. It is one of the common weeds of Central America.

Crotalaria longirostrata Hook. & Arn. Bot. Beechey Voy. 6: 285. 1838. *Chipilín*; *Tcap-in* (Jacaltenango); *Chop* (Huehuetenango, fide Tejada).

Moist or rather dry thickets or open, often rocky hillsides, frequently in pine or oak forest, often abundant in cultivated fields, and commonly planted in fields or gardens, 2,300 meters or less; Petén; Alta Verapaz; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Sacatepéquez; Chimaltenango; Sololá; Suchitepéquez; Retalhuleu; Quezaltenango; Huehuetenango. Western and southern Mexico; Salvador to Costa Rica.

Plants essentially annual but often persisting for more than a year, slender, erect, sometimes much branched, often a meter high or taller, the stems strigillose or glabrate, frequently dark red; stipules minute or none; leaves long-petiolate, the 3 leaflets oblong to obovate or elliptic, 1-3 cm. long, rounded at the apex, glabrous

above, paler and strigose or sericeous beneath; racemes terminal, usually long and many-flowered; calyx 5 mm. long, strigose, bilabiate, the lobes mostly shorter than the tube; corolla bright yellow, large, about 1.5 cm. long, the standard glabrous or with a few appressed hairs along the costa, the beak long and narrow, bent at a right angle; legume 2 cm. long and 7-8 mm. thick, strigillose, usually densely so.

This is an important food plant of Guatemala, and is probably the species of *Crotalaria* most used as food. The young leafy shoots are cooked and eaten like spinach and other pot herbs, and large quantities of the plant, tied in small bunches, are sold in all the markets. Much of the market material is taken from spontaneous plants that spring up in gardens and cornfields, but often the plants are grown in gardens like other vegetables. The name "chipilín" is of Nahuatl derivation. There is a *caserio* called Los Chipilines in Huehuetenango. The name of an *aldea* of Escuintla, Chipilapa, signifies a place where *chipilín* is abundant or planted. It is stated that when the plant is eaten it sometimes produces drowsiness, which may well be true, since some of the species of the genus are known to contain small amounts of a poisonous alkaloid. The roots are considered poisonous in Guatemala, and are sometimes mixed with maize paste and placed in fields to poison marauding mammals. In the Jocotán region (Chiquimula) the leaves are administered—just how is not stated—as a purgative or vomitive, the leaves being held downward for the former purpose and upward for the latter!

***Crotalaria maypurensis* HBK. Nov. Gen. & Sp. 6: 403. 1824.**
Chipilín; Chipilín de culebra; Chipilín de conejo.

Moist or dry thickets or open forest, often in pine-oak forest, sometimes on open hillsides or on sandbars along streams, 2,100 meters or less; Alta Verapaz; El Progreso; Chiquimula; Jalapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Huehuetenango. Southern Mexico; British Honduras; Honduras; Costa Rica; Panama; Cuba; northern South America.

Plants erect, essentially annual but sometimes persistent for more than a year, usually about a meter high, strict, sparsely branched, the stems sparsely strigillose or almost glabrous; stipules minute or none; petioles mostly much shorter than the terminal leaflet; leaflets 3, narrowly oblong or lance-oblong, mostly 2-6 cm. long and 1.5 cm. wide or narrower, narrowly obtuse or subacute, mucronate, glabrous above, sparsely strigillose beneath; racemes chiefly terminal, often much elongate, the flowers rather remote, the rachis angulate; calyx densely strigose, very broad, the lobes unequal, about as long as the tube, acuminate; corolla bright yellow, 1.5 cm. long, the standard glabrous; legume stipitate, rather densely strigose, 2.5-3 cm. long, 1 cm. thick.

This species seldom if ever is used for food.

Crotalaria mollicula HBK. Nov. Gen. & Sp. 6: 403. 1824.
Chipilín; Chipilín de monte.

Open oak and pine forest or in moist thickets, 1,000–2,100 meters; Zacapa; Jalapa; Sacatepéquez; Chimaltenango; Sololá; Huehuetenango; Quezaltenango. Mexico; Salvador.

Plants erect, much branched, a meter high or less, herbaceous or frutescent, the stems densely pilose with short soft spreading hairs; stipules small or none; petioles mostly shorter than the terminal leaflet; leaflets 3, oblong-elliptic, mostly 3–5.5 cm. long, thin, obtuse or subacute, densely and softly pilose on both surfaces with somewhat spreading or laxly appressed hairs, paler beneath; racemes opposite the leaves, mostly rather short and few-flowered; calyx 5–6 mm. long, appressed-pilose, the lobes narrow, much longer than the tube; flowers yellow or greenish yellow, rather small, the keel 12 mm. long or shorter; legume 2–2.5 cm. long, 8 mm. thick, densely pilose with long soft spreading hairs.

Var. *Schaffneri* Senn (Rhodora 41: 355. 1939) has been reported from Tecpán, Chimaltenango, *Skutch* 535. It is distinguished by having the leaflets glabrous on the upper surface. The Indians of Huehuetenango have a belief that if a branch of the plant is placed under the pillow, sleep will be induced.

Crotalaria mucronata Desv. Journ. Bot. 3: 76. 1814. *C. striata* DC. Prodr. 2: 131. 1825.

Probably native of the Old World tropics, naturalized and cultivated in some parts of the American tropics; it has been planted in Guatemala as a green manure crop, and sometimes spreads to waste and cultivated ground, as at Finca Monterrey, Volcán de Fuego (Escuintla).

A coarse erect herb 1–2 meters high, branched, the stems strigillose or glabrate; petioles somewhat shorter than the terminal leaflet; leaflets 3, elliptic or elliptic-obovate, 4–10 cm. long, rounded to subacute at the apex, glabrous on the upper surface, thinly strigillose beneath; stipules none or minute; racemes terminal, many-flowered, often 30 cm. long; calyx bilabiate, strigose, the lobes ovate or ovate-lanceolate; corolla yellow, 1 cm. long, the standard with dark purple stripes outside; legume sparsely or densely strigose, 4 cm. long, 8 mm. thick, abruptly short-rostrate.

Crotalaria nitens HBK. Nov. Gen. & Sp. 6: 399. 1824.

Wet to dry pine forest, or sometimes in open places, or on sandbars along streams, 400–1,700 meters; Alta Verapaz; Quiché; Huehuetenango. Southern Mexico; Honduras; Colombia to Paraguay.

Plants erect, 1–1.5 meters high, herbaceous or frutescent, strict, the stems densely fulvous-sericeous; leaves simple, sessile, narrowly oblong, 2.5–6 cm. long, 8–15 mm. wide, narrowly rounded to acute at the apex, densely sericeous or strigose

on both surfaces; racemes terminal, few-flowered, the bracts and bractlets rather large and conspicuous, brown-sericeous; calyx densely sericeous, the narrow lobes 1-2 times as long as the tube; corolla 1.5 cm. long, the standard glabrous, the beak of the keel short, attenuate; legume 2.5-3 cm. long, glabrous, 10-12 mm. thick, broadly rounded and short-rostrate at the apex.

Crotalaria pumila Ortega, Hort. Bot. Matrit. Dec. 2: 23. 1797.
C. lupulina HBK. Nov. Gen. & Sp. 6: 402. pl. 590. 1824. *Chipilín*;
Chipilincillo (Petén).

Open, oak or pine forest or open rocky slopes, frequently in cultivated fields or on sandbars, 200-2,300 meters; Petén; Zacapa; Jalapa; Jutiapa; Santa Rosa; Guatemala; Chimaltenango; Huehuetenango; Quezaltenango. Southern United States; Mexico; British Honduras; West Indies; South America.

Plants annual, erect, commonly 50 cm. high or less but sometimes taller, usually much branched, the stems strigillose or almost glabrous; petioles slender, longer than the leaflets; leaflets 3, broadly obovate to obovate-oblong, mostly 1-2 cm. long, rounded at the apex, thin, glabrous above, strigillose beneath; stipules minute or none; racemes mostly few-flowered; calyx strigillose, the lobes longer than the tube; corolla yellow, the standard striped with reddish, strigose outside about the apex, the keel 6-11 mm. long; legume about 15 mm. long and 8 mm. broad, broadly rounded and mucronate at the apex, strigose or glabrate.

Called "tronadora" in Yucatan.

Crotalaria Purshii DC. Prodr. 2: 124. 1825.

The typical form of the species, with stipules decurrent upon the stems, ranges from southern United States to western Mexico. The species is represented in Guatemala by the following variety:

Crotalaria Purshii var. **polyphylla** (Riley) Senn, Rhodora 41: 346. 1939. *C. polyphylla* Riley, Kew Bull. 333. 1923. *C. quercetorum* Brandeg. Univ. Calif. Publ. Bot. 10: 407. 1924.

Moist to wet savannas or in open, pine and oak forest, often on open banks or rocky slopes, sometimes on sandbars, 2,000 meters or less; Alta Verapaz; Izabal; Zacapa; Chiquimula; Santa Rosa; Sacatepéquez; Chimaltenango; Huehuetenango. Western and southern Mexico.

Plants annual, erect, mostly 30 cm. high or less, simple or often much branched from the base, the stems strigose; stipules minute or none; leaves simple, linear to narrowly oblong, mostly 2-4 cm. long, obtuse or acute, glabrous above, strigose beneath; racemes terminal and opposite the leaves, 4-6-flowered; calyx densely strigose, the lobes narrow, much longer than the tube; corolla yellow, 8 mm. long, scarcely or not at all exceeding the calyx, the standard glabrous; legume 1.5-2.5 cm. long, 7 mm. broad, glabrous.

Crotalaria retusa L. Sp. Pl. 715. 1753.

A single collection seen, from Dept. Guatemala, perhaps cultivated at Finca La Aurora. Southern United States; Mexico; British Honduras to Panama; West Indies; South America; Old World tropics.

Plants erect, stout, annual, the stems strigose, simple or sparsely branched, a meter high or less; stipules minute or none; leaves simple, subsessile, oblanceolate to spatulate-oblong, 4–8 cm. long, rounded or emarginate at the apex, narrowed to the base, rather thick, glabrous above, strigose beneath; racemes terminal, often long and many-flowered, the pedicels 1 cm. long or shorter; calyx 1 cm. long, bilabiate, sparsely strigose; corolla yellow, almost 2 cm. long, usually drying dark; legume 2.5–3.5 cm. long, 1 cm. thick, glabrous, broadly rounded and short-rostrate at the apex.

Called “chinchín” in Honduras. This species almost certainly grows along the Atlantic coast of Guatemala, although we have seen no specimens from that region. It grows mostly in sandy places close to seashores. Senn speaks of this as an Old World plant introduced into America, a statement for which probably little proof can be adduced.

Crotalaria sagittalis L. Sp. Pl. 714. 1753. *C. belizensis* Lundell, Amer. Midl. Nat. 29: 473. 1943 (type from Monkey River, Toledo District, British Honduras, *P. H. Gentile* 4144). *Chipilín de monte*; *Chipilín de montaña*; *Trébol silvestre*.

Chiefly on open, rather dry, often rocky hillsides, sometimes in pine-oak forest, often on sandbars, 2,500 meters or lower; Alta Verapaz; Izabal; Chiquimula; Guatemala; Sacatepéquez; Chimaltenango; Quezaltenango. Eastern and southern United States; Mexico; British Honduras to Panama; West Indies; South America.

Plants annual or essentially so, erect or ascending, simple or branched, commonly 10–20 cm. high, the stems pilose with spreading or ascending hairs, generally densely so; stipules usually present, conspicuous, and decurrent as narrow wings on the stems; leaves simple, linear to oblong-lanceolate, very variable in shape and size, commonly 5 cm. long or shorter, acute or obtuse, sparsely or densely pilose on both surfaces with usually long yellowish hairs, paler beneath; racemes few-flowered; calyx hirsute, the lobes much longer than the tube; corolla yellow or buff, the standard 1 cm. long or shorter, usually longer than the calyx, glabrous; legume 1–2.5 cm. long, oblong, glabrous.

Called “espadilla” in Salvador. Senn recognizes three varieties: *typica*; *Blumeriana* Senn (*Rhodora* 41: 339. 1939); and *fruticosa* (Mill.) Fawc. & Rendle (*Fl. Jam.* 4: 10. 1920; *C. fruticosa* Mill. Gard. Dict. ed. 8. 1768). None of these are too well marked, as would be expected in a plant so variable. Var. *fruticosa* is a strict,

erect, usually simple form with linear leaves, collected in British Honduras, Izabal, and Guatemala. Var. *Blumeriana* is a small, apparently depauperate form with broad leaves and small legumes, only 7–15 mm. long; it occurs in Guatemala and Quezaltenango. We have not seen authentic material of *C. belizensis*, which is described as having very narrow leaves, but from description it appears referable here.

***Crotalaria Tuerckheimii* Senn, Rhodora 41: 334. 1939.**
Chipilín; Tzutzuyuén (Cobán, Quechí).

Moist thickets, often in open pine-oak forest, 2,100 meters or less; Alta Verapaz (type from Cobán, *Tuerckheim* II.1282); Baja Verapaz; Zacapa; Chiquimula; Jutiapa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Huehuetenango; Quezaltenango. Mexico; Salvador; Panama; Cuba.

Plants annual, erect, mostly 30 cm. high or less, usually branched, the stems pilose with spreading fulvous hairs; leaves simple, narrowly ovate or lance-ovate, 2.5–4 cm. long, 1–1.5 cm. wide, obtuse or rounded at the apex, sessile, rather thin, pilose on both surfaces with chiefly spreading, fulvous hairs; upper stipules conspicuous, decurrent as wings upon the stems; racemes lateral and subterminal, 1–few-flowered; calyx fulvous-pilose, 1 cm. long, the lobes much longer than the tube; corolla yellow, about as long as the calyx, the standard glabrous; legume 2.5–3 cm. long, 12 mm. broad, glabrous.

This is not sharply distinguished from *C. sagittalis*, and could perhaps be treated best as a variety of that, if it is considered necessary to distinguish it by name.

***Crotalaria verrucosa* L. Sp. Pl. 715. 1753.**

Sandy soil at or near sea level, British Honduras; Nicaragua; Costa Rica; Panama; West Indies; Colombia; Old World tropics.

An annual herb less than a meter high, branched, the stems angulate, strigillose or almost glabrous; stipules semiorbicular, herbaceous, green, 5–8 mm. long; leaves simple, short-petiolate, broadly ovate or ovate-elliptic, 3–7 cm. long, rounded to acute at the base, broadly cuneate at the base, glabrous above or nearly so, appressed-pilose beneath; racemes several-flowered, longer than the leaves, the rachis angulate, the flowers slender-pedicellate; calyx sparsely strigillose, the lobes unequal, longer than the tube; corolla blue and white, 1–1.5 cm. long, the standard glabrous; legume sessile, 3–4 cm. long, appressed-pilose.

Called "Virgin flower" in British Honduras.

***Crotalaria vitellina* Ker in Lindl. Bot. Reg. 6: pl. 447. 1820.**
C. cajanifolia HBK. Nov. Gen. & Sp. 6: 405. 1824. *C. guatemalensis* Benth. ex Oerst. Kjoeb. Vid. Medd. 1853: 2. 1854 (no material from

Guatemala is mentioned, despite the specific name). *Chipilín*; *Chipilín de caballo*; *Chipilín de zope*; *Chinchín de zope*.

Moist thickets and fields, often in waste or cultivated ground, sometimes on brushy rocky hillsides, 200–2,400 meters; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Sololá; Suchitepéquez; Retalhuleu; Quezaltenango; Huehuetenango. Mexico; British Honduras; Salvador; Costa Rica; Panama; Cuba.

Plants erect, herbaceous or suffrutescent, commonly 1–1.5 meters high, sometimes lower, the stems fulvous-strigose or glabrate; petioles equaling or longer than the terminal leaflet; stipules minute or none; leaflets 3, ovate-elliptic, sometimes obovate or obovate-elliptic, mostly 3–7 cm. long and 1–3.5 cm. wide, thin, acute or acutish, green and glabrous above, paler beneath, sparsely or densely strigose; racemes chiefly opposite the leaves, dense or rather lax, often many-flowered; calyx strigose, 7–8 mm. long, the lobes much longer than the tube; corolla bright yellow or greenish yellow, 1.5 cm. long or larger, the standard glabrous; legume about 2 cm. long and 7 mm. thick, densely strigose, rounded and short-rostrate at the apex.

In Salvador sometimes called “chipilín de venado,” “chipilín montés,” “chipilín de zope,” and “cohetillo.” This species is used commonly as a vegetable, like *C. longirostrata*, these being the two species ordinarily used for food in Central America. Closely related, if actually distinct, is *C. anagyroides* HBK., reported by Senn from Mexico and Honduras. *C. vitellina* var. *Schippii* Senn (Rhodora 41: 364. 1941) is a form in which the leaflets are pilose on the upper surface. The type is from Stann Creek, British Honduras, W. A. Schipp 493.

DALBERGIA L.

Unarmed trees or shrubs, sometimes more or less scandent; leaves alternate, odd-pinnate or sometimes 1-foliolate, the leaflets alternate; flowers mostly small, white or purplish, in axillary or terminal racemes, cymes, or panicles; bracts and bractlets minute; upper 2 calyx teeth broader, the lowest one usually longer than the others; standard ovate or orbicular, the wings oblong; keel obtuse, the petals connate dorsally at the apex; stamens all connate, or the vexillar one free, the anthers small, erect, didymous, the cells shortly dehiscent at the apex or rarely longitudinally dehiscent; ovary stipitate, few-ovulate, the style short, incurved, the stigma small, terminal; legume subreniform to oblong or linear, more or less samaroid, compressed and flat, indehiscent, with 1 or few seeds, sometimes slightly thickened, often reticulate-veined, the upper margin sometimes marginate but not winged; seeds reniform, compressed, the radicle inflexed.

Species 100 or more, in the tropics of both hemispheres. Three or more additional species are known from Central America. Some Central American trees of this genus are of great economic importance as furnishing the rosewood or cocobolo of commerce.

Leaves 1-foliolate.

Leaflet glabrous or essentially so, usually subcordate at the base, not pale beneath; legume 1-3-seeded.....*D. Brownei*.

Leaflet densely strigillose and pale beneath, not at all cordate at the base; legume 1-seeded.....*D. Ecastaphyllum*.

Leaves with 3 or more numerous leaflets.

Leaflets small, mostly 1-2.5 cm. long, rounded and often emarginate at the apex, strigillose beneath.....*D. glabra*.

Leaflets larger, mostly 3.5-9 cm. long, often acute to acuminate or narrowed at the apex, sometimes rounded, variously pubescent.

Blade of the standard petal straight or scarcely reflexed; style short and thick; leaflets usually densely pilose beneath, the hairs generally more or less spreading.

Leaflets ovate or ovate-elliptic, mostly 3-4.5 cm. long. .*D. melanocardium*.

Leaflets chiefly oblong or elliptic-oblong and 5-10 cm. long. .*D. tucurensis*.

Blade of the standard petal abruptly reflexed; style slender; leaflets variously pubescent beneath or almost glabrous.

Legume densely brown-tomentulose; leaflets broadly rounded at the apex.
D. Funera.

Legume glabrous or nearly so; leaflets not rounded at the apex.

Leaflets 3-5, abruptly acuminate, glabrous.....*D. monetaria*.

Leaflets mostly 7 or more, never abruptly acuminate, usually narrowed to an obtuse apex.

Legume glaucous; branches of the inflorescence densely pubescent.
D. calycina.

Legume not glaucous; branches of the inflorescence glabrate.

Leaflets glabrous beneath.....*D. laevigata*.

Leaflets strigillose or somewhat sericeous beneath.

Legume 1.5 cm. wide; leaflets 3.5-5.5 cm. long. . . .*D. Stevensonii*.

Legume 2 cm. wide; leaflets mostly 8-12 cm. long. . . .*D. pacifica*.

Dalbergia Brownei (Jacq.) Urban, Symb. Antill. 4: 295. 1905.
Amerimnon Brownei Jacq. Enum. Pl. Carib. 27. 1760. *D. Amerimnum* Benth. Journ. Linn. Soc. 4: Suppl. 36. 1860.

Chiefly in mangrove swamps, at sea level; Alta Verapaz; Izabal. Southern Mexico; British Honduras, along the Atlantic coast to Panama; West Indies; Colombia and Venezuela.

A shrub or small vine, the branches sometimes elongate and twining, glabrous, dark brown; petiole slender, 1.5 cm. long or shorter; leaflet 1, ovate, 5-7 cm. long, acute with an obtuse tip, usually subcordate at the base, glabrous or practically so, very lustrous above; flowers numerous, white, fragrant, the panicles small, very dense and contracted, little longer than the petioles, somewhat corymbiform, the pedicels puberulent; calyx 4-5 mm. long, puberulent or glabrate; standard almost 1 cm. long; stamens 10; legume 1-seeded and 1-3 cm. long or 3-4-seeded and 3.5-5 cm. long, 1 cm. wide, rather thick and hard, glabrous.

Called "red fowl" in British Honduras; "barbasco" (Campeche); "cruceta" (Veracruz).

Dalbergia calycina Benth. Journ. Linn. Soc. 4: Suppl. 35. 1860.

Type said to have been collected in Guatemala by Friedrichsthal, the locality not specified; sterile material from the Department of Guatemala is possibly referable here. State of Mexico.

A tree, the branches ochraceous, the branchlets densely pubescent; leaflets 5-11, rather long-petiolulate, broadly ovate to oblong-ovate, 4-6 cm. long, somewhat narrowed to the obtuse apex, obtuse at the base, glabrous, pale beneath, dull; racemes mostly simple and few-flowered, numerous, the rachis densely pubescent; flowers pedicellate, the pedicels densely pubescent; calyx about 1 cm. long, attenuate at the base, densely and softly pubescent; stamens 9, monadelphous; standard 1.5 cm. long, glabrous; ovary glabrous, 4-6-ovulate; legume usually 1-seeded, glabrous, 5-7 cm. long, long-stipitate, narrowed at the base to a rather long stipe, glaucous, about 1.8 cm. wide.

There is no certainty that the type was collected in Guatemala, and it may have been obtained farther southward, in Nicaragua or Costa Rica. Our interpretation of the species, of which we have seen no authentic representation, is based upon Mexican collections determined at Kew, and presumably compared with the type. In Mexico the vernacular name is "cahuirica."

Dalbergia Ecastaphyllum (L.) Taub. in Engl. & Prantl, Pflanzenfam. 3, pt. 3: 335. 1894. *Hedysarum Ecastaphyllum* L. Syst. Nat. ed. 10. 1169. 1759.

Thickets along the seashore, often in mangrove swamps; Izabal. British Honduras, along the Atlantic coast to Panama; West Indies; Colombia and Venezuela; western tropical Africa.

A shrub or small tree, often somewhat scandent, the branches sparsely brownish-strigillose; petiole short, the leaflet 1, oval-ovate, 5-11 cm. long, acute, the tip obtuse, green above, sparsely appressed-pilose or glabrate, pale beneath and rather densely strigillose; flowers white, fragrant, the inflorescences little longer than the petioles, dense; calyx 3-3.5 mm. long, appressed-pilosulous, the segments subequal; standard 7 mm. long, glabrous; stamens 10; legume 2-3 cm. long and almost as wide, 1-seeded, short-stipitate, strigillose, thick and hard.

This is a characteristic plant of coastal thickets, growing usually just back of the strand, where it sometimes forms dense thickets.

Dalbergia Funera Standl. Field Mus. Bot. 23: 55. 1944. *Ebano*.

Pine-oak forest, 500-2,000 meters; Chiquimula, Jalapa; Huehuetenango. Salvador (type from La Reina, Chalatenango).

A tree of 6-12 meters, the branches fuscous, glabrous or nearly so; leaves rather small, the leaflets 5-7, on rather long petiolules, subcoriaceous, broadly oval to suborbicular, mostly 3.5-6.5 cm. long and 2-4.5 cm. wide, broadly rounded and shallowly emarginate at the apex, rounded at the base, green and glabrous above,

lustrous, the venation prominulous, very pale beneath, glabrous in age, when young sometimes short-pilose; racemes apparently shorter than the leaves, few-flowered and lax; fruit short-pedicellate; legume oblong or spatulate-oblong, 4-5.5 cm. long, 1.5 cm. wide, rounded and apiculate at the apex, acute at the base, short-stipitate, very densely brown-tomentulose, 1-seeded.

Called "funera" in Salvador. The identification of the sterile Guatemalan collections is uncertain but if not referable here, they represent an undescribed species. The wood is said to be of superior quality and color and to be used for fine cabinetwork.

Dalbergia glabra (Mill.) Standl. Field Mus. Bot. 9: 15. 1930. *Robinia glabra* Mill. Gard. Dict. ed. 8. No. 5. 1768. *D. campechiana* Benth. Journ. Linn. Soc. Bot. 4: Suppl. 37. 1860. *D. Purpusii* Brandeg. Univ. Calif. Publ. Bot. 6: 501. 1919. (?) *D. tabascana* Pittier, Journ. Wash. Acad. Sci. 12: 58. 1922. *D. Cibix* Pittier, op. cit. 59. 1922 (type from Yucatan). *Cibix*, *Muc*, *Ixcipix* (Petén, Maya); *Majagua* (Huehuetenango).

Dry to wet thickets or in thin forest, 900 meters or less; Petén; Alta Verapaz; Izabal; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Retalhuleu; Huehuetenango. Southern Mexico; British Honduras; Honduras.

A large shrub or small tree, sometimes scandent and becoming a large vine, the branchlets puberulent at first, soon glabrate; leaflets commonly 7-9, rather thick, mostly oval or broadly oblong, sometimes obovate-oval, 1-2 cm. long or slightly larger, rounded and often emarginate at the apex, obtuse or rounded at the base, green above, sparsely appressed-pilose or glabrous, paler beneath, appressed-pilosulous or glabrate; racemes mostly in small panicles or corymbs at the ends of the branchlets, few-many-flowered, the branchlets puberulent or strigillose, the flowers usually dense and crowded; flowers white, slightly fragrant, 7 mm. long; calyx 2.5-3 mm. long, puberulent or almost glabrous; standard glabrous; stamens 10, monadelphous; legume linear-oblong, 3-8 cm. long, 1-1.8 cm. wide, 1-4-seeded, glabrous or nearly so, reticulate-veined, thin and flexible.

Said to be called "logwood brush" in British Honduras, although not very similar to logwood (*Haematoxylum*). The tough inner bark is much used in the Yucatan Peninsula and Petén as cordage. Closely related and rather doubtfully distinct is *D. paucifoliolata* Lundell of Tabasco, in which the leaves have only 3-5 leaflets.

Dalbergia laevigata Standl. Trop. Woods 12: 5. 1927.

Type from Lower Belize River, British Honduras, *S. J. Record*; collected also in Stann Creek Valley, broken pine ridge.

A tree 15 meters high with a trunk 45 cm. in diameter, the young branchlets sparsely incurved-puberulent; leaflets 9-11, short-petiolulate, oblong-lanceolate

or oblong, 3.5–7.5 cm. long, 1.5–2.8 cm. wide, narrowed to the rather wide, emarginate apex, obtuse or rounded at the base, subcoriaceous, lustrous above, puberulent along the costa, elsewhere glabrous, glabrous beneath, at least in age; panicles long-pedunculate, equaling or longer than the leaves in fruit, the branches sparsely and minutely pilose or puberulent; legume 1–2-seeded, 5.5–8 cm. long, 15–18 mm. wide, thin, glabrous, narrowed to the acute or obtuse apex, gradually attenuate to the base, the stout stipe 5–7 mm. long, the venation of the valves prominent and closely reticulate.

Dalbergia melanocardium Pittier, Journ. Wash. Acad. Sci. 12: 57. 1922. *Amerimnon melanocardium* Standl. Journ. Wash. Acad. Sci. 13: 443. 1923. *Ebano*.

Santa Rosa: Type from Ojo de Agua, 900 meters, Heyde & Lux 3295. State of Mexico; Salvador; Costa Rica.

A tree, sometimes (in Costa Rica) attaining a height of 20 meters, the branchlets densely ferruginous-pubescent with short spreading hairs; leaflets 7–11, thin, broadly ovate or elliptic, mostly 1.5–4.5 cm. long and 1.5–2.5 cm. wide, obtuse or subacute and emarginate at the apex, rounded or obtuse at the base, green above and sparsely pilosulous, slightly paler beneath, at least when young densely pilose with mostly spreading, fulvous hairs; inflorescences congested, shorter than the leaves, cymose, the branches densely fulvous-pilosulous, the flowers sessile or short-pedicellate; calyx fulvous-pilosulous, 2.5 mm. long; petals whitish, glabrous, the standard 8–9 mm. long; stamens 9, monadelphous; ovary 1-ovulate, villous; legume unknown.

Called “chapulaltapa” in Salvador. This species has been reported from Guatemala as *D. variabilis* Vog.

Dalbergia monetaria L. f. Suppl. Pl. 317. 1781.

Wet forest, often in mangrove swamps, at or near sea level; Izabal. British Honduras; Honduras; Costa Rica; West Indies; South America.

A large shrub or small tree, often more or less scandent by twining branches; leaflets 3–5, mostly elliptic or oblong-elliptic and 5–13 cm. long, subcoriaceous, abruptly acuminate or long-acuminate, rounded to subacute at the base, glabrous or nearly so, deep green above, paler beneath; flowers white or cream-colored, the panicles small and dense, ferruginous-puberulent, many-flowered, scarcely longer than the petioles, somewhat corymbiform; calyx 3 mm. long, puberulent; petals 6 mm. long, subequal; stamens 9, in 2 bundles of 4 and 5; legume thick and hard, glabrous, 2.5–3.5 cm. long and almost as wide, long-stipitate, broadly rounded at the apex.

Called “tietie” in British Honduras.

Dalbergia pacifica Standl. & Steyermark. Field Mus. Bot. 22: 236. 1940. *Granadillo*; *Nogal*.

Dry forests of the Pacific coastal plains, 300 meters or less, sometimes growing along roadsides, frequent in some localities, especially in Santa Rosa; endemic; Santa Rosa; Escuintla; Suchitepéquez (type from Cocales, *Standley* 62109).

A large tree, often 15 meters high or more, the branchlets glabrous or nearly so; leaflets mostly 9–11, long-petiolulate, oblong to lance-oblong or the lowest ovate, 6.5–12 cm. long, 2.5–5 cm. wide, somewhat narrowed to the obtuse, shallowly emarginate apex, obtuse or rounded at the base, glabrous and lustrous above, pale or glaucous beneath, densely but minutely appressed-pilous or almost sericeous; racemes axillary, simple or branched, short-pedunculate, the pedicels in fruit 5–8 mm. long; petals white, the standard 2–2.5 cm. long, glabrous; legume narrowly oblong or linear-oblong, 7–12 cm. long, 2 cm. wide, obtuse and mucronate, narrowed at the base to a stipe 1–2 cm. long, thin, glabrous, 1–2-seeded, more or less constricted between the seeds.

This tree is highly esteemed locally for its fine wood and quite possibly the wood is exported, although we have no data to this effect. The species is closely related to others of Salvador, Costa Rica, and Panama that are known to supply cocobolo wood of commerce, which has been used in the cutlery trade of the United States for 50 years or more. Sapwood dingy white and very sharply defined; heartwood highly variable in color but in age usually deep red with black striping or mottling; it is hard and heavy, with a specific gravity of 1.00 or more, fine and uniform in texture, turns readily, takes a high polish, is very durable, and has an oily feel. In the United States cocobolo wood is much used in the cutlery trade for handles of all kinds of knives. It contains an oily substance that tends to waterproof the wood, makes it easy to polish, and is little affected by repeated immersion in soapy water, except that it becomes darker in color. It is used also for small tool handles, brush backs, inlaying, musical and scientific instruments, steering wheels, jewelry boxes, rosary beads, and many other purposes. Fine dust arising when the wood is worked may produce a rash or dermatitis, similar to that caused by poison ivy (*Rhus radicans*). The current local name for *D. pacifica* is "nogal," and this has given rise to reports of true walnut (*Juglans*) in the Pacific coast forests.

***Dalbergia Stevensonii* Standl. Trop. Woods 12: 4. 1927.**

Endemic in British Honduras; type from San Antonio road near Westmoreland, Punta Gorda, Toledo District, *N. S. Stevenson*.

A large or medium-sized tree 15–30 meters high, the branchlets glabrate; leaflets 5–7, on petiolules 4–5 mm. long, elliptic or oblong-elliptic, 3.5–5.5 cm. long, 2.5–3 cm. wide, obtuse or rounded at the apex, sometimes emarginate, acutish to rounded-obtuse at the base, thick, deep green above, lustrous, glabrous, paler

beneath, rather densely but minutely fulvous-sericeous; panicles slender-pedunculate, shorter than the leaves, lax, much branched, the branches very sparsely puberulent; calyx almost glabrous; petals glabrous, subequal, 4 mm. long; legume oblong, thin, 4–4.5 cm. long, 12–14 mm. wide, rounded and apiculate at the apex, acute at the base, 1-seeded, glabrous or nearly so, the slender stipe 5–6 mm. long.

Called "rosewood." This supplies one of the best known timbers of British Honduras. It has been exported in small quantities for more than 100 years. The wood is very hard and heavy, weighing 59–68 pounds per cubic foot when thoroughly air-dry; heartwood pinkish brown or purplish, with alternating light and dark zones; sapwood white when first cut, quickly turning yellow. The heartwood is highly durable, but the sapwood soon decays when in contact with the ground. The wood is often well figured and is used to a small extent for cabinetwork, being employed chiefly in the United States for manufacture of bars of marimbas and xylophones.

Dalbergia tucurensis Donn. Smith, Bot. Gaz. 46: 111. 1908 (type from Concepción near Tucurú, Alta Verapaz, *Tuerckheim* II.1712). *D. variabilis* var. *cubilquitzensis* Donn. Smith, Bot. Gaz. 57: 417. 1914 (type from Cubilgüitz, Alta Verapaz, *Tuerckheim* 4091). *D. cubilquitzensis* Pittier, Journ. Wash. Acad. Sci. 12: 56. 1922. *Granadillo*; *Junero* (*Funero*?); *Ronrón*; *Acuté* (Alta Verapaz).

Moist or wet forest, often on limestone, or in wet thickets, 1,500 meters or less; Alta Verapaz; Izabal. British Honduras; Honduras.

A small to large tree, sometimes 30 meters high, the branchlets densely sordid-pilose with short spreading hairs; leaflets generally 11–15, oblong to oblong-ovate, 6–10 cm. long, 2.5–5 cm. wide, obtuse, rounded or obtuse at the base, sparsely appressed-pilose above or glabrate, usually densely fulvous-pilose beneath with short, more or less spreading, fulvous hairs; racemes paniculate, the panicles small, much shorter than the leaves, very dense and many-flowered, pedunculate, corymbiform, the branches densely brownish-pilosulous; flowers whitish or creamy white, 6–7 mm. long; calyx 5 mm. long or shorter, densely pilose; petals glabrous; legume narrowly oblong, 5 cm. long or slightly longer, almost 1.5 cm. wide, obtuse or rounded and mucronate at the apex, acute at the base, thin, glabrous, reticulate-veined.

Called "rosewood" and "granadillo" in British Honduras; in Honduras, "chaperno" and "rosewood." On the North Coast this is sometimes a tall tree with a cylindric trunk as much as 75 cm. in diameter, free of branches for three-fourths its length; bark fairly thick, nut-brown. The wood is heavy, and the logs will not float. It is used locally for cart axles and tongues, wheel spokes, and other purposes. It is orange-colored with purple streaks, darkening to purplish brown, odorless, rather hard and heavy, very tough, of

medium fine texture, the grain more or less interlocked. The tree is rather plentiful in the wetter regions of the North Coast. *D. tucurensis* and *D. cubilquitzensis* both are maintained as species by Pittier, but the characters by which he attempts to separate them seem to be of no value, and one scarcely expects to find two closely related species inhabiting the same region of Alta Verapaz.

DALEA L.

Annual or perennial herbs or shrubs, the branches, leaves, and calyces usually gland-dotted; leaves pinnate, stipulate and stipellate, the leaflets few or numerous, entire, the stipules and stipels often gland-like; flowers small, white, yellow, purple, or violet, racemose or spicate; calyx campanulate, 5-lobate, 10-costate, the lowest lobe sometimes longer than the others; standard long-unguiculate, the blade generally cordate or reniform; keel petals usually united along their lower margins; stamens normally 10 or 9, rarely 7-8, monadelphous; ovary 1-2-ovulate, the stigma capitate; legume small, indehiscent, obliquely obovoid or semireniform, usually included in the calyx, 1-seeded.

A large genus, the species more than 200, most of them in Mexico, but a considerable number occurring in the Andean region of western South America. One or two additional species occur in southern Central America.

Flowers pedicellate, reflexed; plants glabrous, annual.

Calyx sericeous *D. delicata*.

Calyx glabrous *D. nutans*.

Flowers sessile, ascending or spreading, not reflexed.

Stems glabrous.

Bracts glabrous *D. citriodora*.

Bracts pubescent.

Standard yellow; bracts recurved at the apex *D. dispar*.

Standard purple or violet; bracts not uncinat.

Bracts persistent; leaflets usually 7-15 *D. annua*.

Bracts soon deciduous; leaflets mostly 21-51.

Stamen tube long-exserted, about twice as long as the calyx; spikes 12-14 mm. thick *D. Lagopus*.

Stamen tube short-exserted, little longer than the calyx; spikes 8-10 mm. thick *D. leporina*.

Stems sparsely or densely pilose or tomentose.

Calyx lobes short, most of them shorter than the tube; leaflets 5-9.

D. tomentosa.

Calyx lobes elongate, subulate-tipped, all or most of them longer than the tube.

Flower spikes subsessile at the ends of short axillary branches, also at the ends of the main branches; shrubs, the flowers purple.

Bracts much exceeding the calyx tube, long-acuminate . . . *D. vulneraria*.

Bracts scarcely exceeding the calyx tube, ovate, acute . . . *D. domingensis*.

Flower spikes terminating the main stem or its branches; shrubs or herbs; flowers various in color.

Leaflets acute, 7-11; flower spikes terminating long scape-like naked peduncles; standard violet when dry.....*D. sericea*.

Leaflets very obtuse or rounded at the apex, 11-23; spikes not terminating long scape-like peduncles.

Corolla pale yellow, the flowers often turning black when dried, often somewhat pinkish in fading.

Calyx tube glabrous except on the margins; leaflets 6-14 mm. long.
D. gigantea.

Calyx tube pilose between the costae; leaflets mostly 4-6 mm. long.
D. lutea.

Corolla purple or violet, the flowers not turning black when dried.

Plants annual; stems only sparsely pilose; bracts abruptly setiform-caudate, the acumination about as long as the body.

D. caudata.

Plants perennial; stems densely pilose, at least above; bracts gradually acuminate.

Leaves and young stems densely sericeous, the pubescence pale and closely appressed.....*D. leucosericea*.

Leaves and stems not sericeous, the pubescence rather sparse and mostly of spreading hairs.....*D. versicolor*.

Dalea annua (Mill.) Kuntze, Rev. Gen. 178. 1891. *Psoralea Dalea* L. Sp. Pl. 764. 1753. *P. annua* Mill. Gard. Dict. ed. 8. no. 6. 1768. *D. nigra* Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 43. 1843. *Thornbera Dalea* Rydb. N. Amer. Fl. 24: 120. 1920. *T. robusta* Rydb. op. cit. 121. *Toronjil*; *Azulina silvestre*; *Chicuya azul*; *Chile de coche*; *Plumerito* (fide Aguilar).

Brushy slopes or plains, often in open fields, occasionally in pine-oak forest, frequently a weed in cultivated ground, sometimes in moist or wet places but more common in rather dry situations, 400-2,400 meters; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Quiché; Huehuetenango. Southern Mexico; Salvador to Panama.

A rather stout, erect annual, glabrous except in the inflorescence, simple or usually much branched, the stems gland-dotted; stipules subulate, 3 mm. long; leaf rachis narrowly marginate; leaflets 7-15, oblong-oblancoolate to almost linear, 5-10 mm. long, pale, conspicuously gland-dotted beneath; peduncles short, terminating the branches, the spikes very dense, 1-5 cm. long, 8-10 mm. thick; bracts persistent, lanceolate, acuminate, gland-dotted, puberulent or glabrous, ciliate; calyx tube 2 mm. long, glandular between the costae, the lobes lance-subulate, sericeous-plumose, equaling the tube or longer; petals violet or bluish purple; fruit pubescent at the apex.

This has been reported from Guatemala as *D. alopecuroides* Nutt. It is a common weed in many regions of Guatemala, especially in

old cornfields. Sometimes known in Salvador as "anisillo montés" and "cabezona."

Dalea caudata (Rydb.) Bullock, Kew Bull. 195. 1939. *Parosela caudata* Rydb. N. Amer. Fl. 24: 112. 1920.

On rocky hillsides covered with scrub oak, or on open slopes, 1,200–1,700 meters; Alta Verapaz (near San Cristóbal); Jalapa. Southern Mexico.

An erect annual, 60 cm. high or less, branched, slender or stout, the stems sparsely pilose with long spreading weak hairs; stipules filiform, 4 mm. long; leaf rachis sparsely pilose; leaflets 7–11, oblong, 5–15 mm. long, rounded at the apex, glabrous above, paler and sparsely pilose beneath or almost glabrous, minutely punctate, ciliate; peduncles terminal, shorter than the spikes, the spikes dense, cylindric, 2–6.5 cm. long, 1 cm. thick; bracts persistent, obovate, concave, glabrous, minutely glandular-punctate, abruptly narrowed into a subulate-filiform tip; calyx tube campanulate, 2 mm. long, appressed-pilosulous, eglandular, the lobes very short, minute, acute; corolla bright purple; stamen tube much exserted beyond the calyx; fruit glabrous, minutely glandular.

We have seen no authentic material of this species, but two collections from the Department of Jalapa agree perfectly with Rydberg's description.

Dalea citriodora (Cav.) Willd. Sp. Pl. 3: 1339. 1803. *Psoralea citriodora* Cav. Icon. 3: 36. pl. 271. 1794. *D. polyphylla* Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 44. 1843. *Parosela citriodora* Rose, Contr. U. S. Nat. Herb. 10: 104. 1906. *Parosela polyphylla* Rose, loc. cit. *Parosela roseola* Rydb. N. Amer. Fl. 24: 81. 1920 (type from Volcán de Jumaitepeque, Santa Rosa, Heyde & Lux 4166). *Trébol*; *Tortolita*; *Toronjil*.

Open fields or grassy or rocky hillsides, sometimes in rather open thickets or in pine-oak forest, frequently in and along stream beds, 200–2,100 meters; Zacapa; Chiquimula; Jalapa; Jutiapa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Huehuetenango. Southern Mexico.

Plants annual, erect, a meter high or less, often much branched from the base, glabrous, the slender stems often dark red; stipules setaceous, 3 mm. long; leaflets 13–23, oblong, 3–5 mm. long, obtuse, often glandular-apiculate, glabrous, eglandular or with a few minute glands along the margins toward the apex; peduncles terminal, slender, 1–5 cm. long, the spikes dense, 2 cm. long or shorter, 6–8 mm. thick; bracts rounded-obovate, abruptly short-acuminate, with 2 inconspicuous glands; calyx tube sericeous, 2–2.5 mm. long, the lobes triangular, acute, less than half as long as the tube; corolla red-purple or rose-purple; fruit broadly oblique-ovate, minutely puberulent near the apex.

Dalea delicata (Rose) Greenm. Field Mus. Bot. 2: 331. 1912.
Parosela delicata Rose, Contr. U. S. Nat. Herb. 8: 304. 1905.

Open grassy slopes or on gravel bars along streams, 200–250 meters; Zacapa. Southern Mexico.

Plants annual, very slender, glabrous outside the inflorescence, usually diffusely branched from the base and spreading, the stems often dark reddish, glandular-punctate; stipules minute, subulate; leaf rachis submarginate; leaflets 15–31, cuneate-oblong, 2 mm. long, somewhat retuse, punctate beneath and on the margins; peduncles filiform, 1–2 cm. long, the racemes lax, 1–2 cm. long, 3–9-flowered, the flowers easily deciduous, on pedicels 1 mm. long; calyx turbinate, the tube 2.5 mm. long, sparsely sericeous on the costae, the lobes ovate, obtuse to short-acuminate, about equaling the tube, serrulate; petals purple; fruit oblique-obovate, sparsely pubescent, shorter than the calyx, short-rostrate.

Dalea dispar Morton, Phytologia 1: 147. 1935.

Moist thickets or in thin forest, 1,800–2,700 meters; endemic; Jalapa; Jutiapa; Sacatepéquez; Chimaltenango (type from Chichavac, A. F. Skutch 259); Quezaltenango.

A rather stout shrub 2 meters high or less, sometimes herbaceous, glabrous or nearly so except in the inflorescence, usually much branched; stipules linear-subulate, 1 cm. long or less; leaflets about 15, oblong, 2 cm. long and 6 mm. wide or somewhat smaller, mucronate, obtuse at the base, glandular-punctate beneath; spikes sessile or nearly so, 5–17 cm. long, 2 cm. thick, very dense, the flowers sessile or nearly so; bracts lanceolate, subulate-attenuate, very conspicuous before anthesis and much exceeding the buds, the tips more or less recurved; calyx tube 3–3.5 mm. long, glandular-punctate, villous, the lobes subulate, 2 mm. long, villous; petals pale greenish yellow, sometimes turning purplish in age, the standard as much as 7 mm. long; ovary hirsute, the style villous.

Although of wide distribution in Guatemala, the plant seems to be of only sporadic occurrence.

Dalea domingensis DC. Prodr. 2: 246. 1825. *Psoralea humilis* Mill. Gard. Dict. ed 8. no. 7. 1768, not *Dalea humilis* G. Don, 1832. *Parosela domingensis* Millsp. Field Mus. Bot. 1: 21. 1895. *Parosela humilis* Rydb. N. Amer. Fl. 24: 114. 1920. *Plumón* (fide Aguilar).

Wet to dry, brushy plains or hillsides, 1,500 meters or less; Petén; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Guatemala. South-western Texas and Mexico; Salvador.

A branched shrub, usually 1–1.5 meters high, the branches villous or pilose; stipules subulate, 2–5 mm. long; leaflets 3–9, oval or obovate, rounded at the apex and often retuse, short-villous on both surfaces, gland-dotted beneath; spikes usually short and thick, sometimes elongate in age, dense and many-flowered, mostly sessile in the leaf axils; bracts ovate, about equaling the calyx tube, acute, pubescent, gland-dotted; calyx tube pubescent, 2.5–3 mm. long, conspicuously

gland-dotted between the costae, the lobes filiform, plumose, the lowest one sometimes 5 mm. long and uncinatate at the apex, the others shorter; petals at first yellowish or pale purplish, turning brown-purple in fading; fruit villous and gland-dotted near the apex.

Rydberg maintained *D. domingensis* and *D. humilis* as distinct species, besides recognizing various other segregates, but the characters by which he attempted to distinguish them seem to be inconsistent and at best of little importance. In Yucatan *D. domingensis* is said to bear the Maya name "chinimisi."

Dalea gigantea (Rose) Bullock, Kew Bull. 196. 1939. *Parosela gigantea* Rose ex Rydb. N. Amer. Fl. 24: 110. 1920. *Escoba*; *Escobeta* (fide Aguilar).

Pine-oak forest, moist thickets, open rocky slopes, 1,400–2,800 meters; Jalapa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Quiché; Huehuetenango. Southern Mexico.

A slender or rather stout shrub 1–2 meters high, much branched, the branches usually abundantly villous and gland-dotted, sometimes glabrate; stipules subulate-setaceous, 3–5 mm. long; leaflets 11–17, oval or obovate, 6–15 mm. long or even larger, thin, rounded at the apex, pilose on both surfaces or rarely glabrate, dotted beneath with black glands; peduncles terminal, 2–7 cm. long, the spikes dense, 3–11 cm. long, 1 cm. or more in diameter; bracts broadly ovate, blackish when dried, glabrous, gland-dotted, abruptly caudate, the tip exceeding the calyx, deciduous; calyx tube 3 mm. long, glabrous, with conspicuous blackish glands between the costae, the lobes long-pilose, subulate from a triangular base, 2 mm. long or more; petals greenish yellow, turning blackish in fading; fruit sparsely pilose and bearing a few glands.

Rather common in some parts of the central uplands and often forming small thickets; unattractive and even unpleasant in appearance because of the blackish old inflorescences and the usually dirty pubescence. The pubescence is variable, and one collection from Chimaltenango is from an almost glabrous plant.

Dalea guatemalensis Benth. ex Hemsl. Biol. Centr. Amer. Bot. 1: 241. 1880. A nomen nudum, applied to a specimen collected by Wendland in Guatemala.

Dalea Lagopus (Cav.) Willd. Sp. Pl. 3: 1340. 1803. *Psoralea Lagopus* Cav. Icon. 1: 59. 1791. *Parosela Lagopus* Cav. Descr. Pl. 187. 1802.

Oak-pine forest, or on gravel beds along streams, 1,600–1,850 meters; Guatemala; Jalapa; Chimaltenango; Sololá; Quiché; Huehuetenango. Southern Mexico; reported from Costa Rica, but probably in error.

An erect glabrous annual a meter high or less, usually much branched, the stems often reddish, glandular-verrucose; stipules subulate, 4–6 mm. long; leaf rachis marginate; leaflets 21–51, oblong, 4–8 mm. long, obtuse or retuse, gland-dotted beneath; peduncles terminating the branches, 5–15 cm. long, the spikes dense, 2–10 cm. long, 12–14 mm. thick; bracts lanceolate, acuminate, glabrous, deciduous, equaling the calyx; calyx tube glabrous, with conspicuous yellow glands between the costae, the lobes filiform from a triangular base, sericeous-pilose, equaling the tube; petals violet; fruit minutely gland-dotted near the apex, ciliate dorsally.

Dalea leporina (Ait.) Bullock, Kew Bull. 196. 1939. *Psoralea leporina* Ait. Hort. Kew. 3: 81. 1789. *Parosela leporina* Rydb. N. Amer. Fl. 24: 78. 1920. *Plumerito hediondo* (fide Aguilar).

Oak forest, moist fields, on gravel beds along streams, often a weed in cultivated fields, 1,400–2,000 meters; Jalapa; Huehuetenango. New Mexico and Arizona; Mexico.

A slender annual a meter high or less, erect, sparsely branched, glabrous outside the inflorescence; stipules subulate, 2–3 mm. long; leaf rachis marginate; leaflets 21–35, oblong, 5–10 mm. long, rounded or retuse at the apex, paler and gland-dotted beneath; peduncles terminating the branches, 5–15 cm. long, the spikes dense, 2–6 cm. long, 8–10 mm. thick; bracts ovate or lanceolate, acuminate, soon deciduous, longer than the flower buds, pubescent below; calyx tube sericeous-pilose, 2–2.5 mm. long, the lobes subulate-setaceous from a broad base, about equaling the tube; petals blue; fruit sericeous-pilose.

Dalea leucosericea (Rydb.) Standl. & Steyermark, comb. nov. *Parosela leucosericea* Rydb. N. Amer. Fl. 24: 104. 1920.

Dry rocky hillsides, 1,500–1,700 meters; Zacapa (Sierra de las Minas); Jalapa (Potrero Carrillo, *Steyermark* 33127). Oaxaca.

Plants perennial, erect, 50 cm. high or less, branched from the base or throughout, the stems herbaceous or somewhat woody, villous or sericeous; leaflets 9–11, oval, 5–10 mm. long, rounded and mucronate at the apex, sericeous; spikes terminating the branches, sessile or nearly so, 2–3 cm. long, 1 cm. thick, very dense; bracts lanceolate, equaling the calyx, sericeous; calyx tube 3 mm. long, densely villous, the lobes subulate, equaling the tube, long-villous; petals rose-purple or violet; fruit villous above, glabrate near the base.

We have seen no authentic material of the species, but the Guatemalan material agrees well with the original description.

Dalea lutea (Cav.) Willd. Sp. Pl. 3: 1341. 1803. *Psoralea lutea* Cav. Icon. 4: 12. 1797. *Parosela lutea* Cav. Descr. Pl. 186. 1802. *D. cinerea* Moric. ex Donn. Smith, Bot. Gaz. 20: 283. 1895 (type from Santiago, Sacatepéquez, *Rosalio Gómez* 999).

At 1,650–1,950 meters; Sacatepéquez. Mexico.

A low shrub, commonly 30–50 cm. high, much branched, at least from the base, the stems densely pubescent; leaflets 15–21, elliptic or oval, 4–6 mm. long, rounded or retuse at the apex, pilose, more densely so beneath; peduncles terminal, 1–5 cm. long, the spikes dense, 2–8 cm. long, 1 cm. thick or more; bracts ovate, acuminate, pubescent or glabrate, often blackish; calyx tube 2.5 mm. long, pilose, gland-dotted between the costae, the lobes pilose-ciliate, subulate from a triangular base; petals yellow; fruit densely villous.

Dalea nutans (Cav.) Willd. Sp. Pl. 3: 1339. 1803. *Psoralea nutans* Cav. Icon. 3: 1. 1794. *D. diffusa* Moric. Mém. Soc. Genève 6: 536. 1833. *Parosela diffusa* Rose, Contr. U. S. Nat. Herb. 8: 305. 1905. *Parosela nutans* Rose, op. cit. 306. *Escoba de patio*; *Pata de gallo*; *Cancha*; *Canchalagua*; *Pie de paloma*.

Dry or wet fields, often a weed in cultivated ground, frequent on brushy or rocky hillsides, sometimes on gravel bars along streams, occasionally in oak forest, 800–2,000 meters; Baja Verapaz; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Quiché; Huehuetenango. Mexico; Salvador to Costa Rica.

A slender erect annual a meter high or less, often densely branched, glabrous throughout, the stems reddish or purplish, minutely gland-dotted; petioles 3–5 mm. long, the rachis marginate; leaflets 11–41, or in the upper leaves fewer, oblong, 5–10 mm. long, gland-dotted on the margins and lower surface; peduncles terminating the branches, 1–2 cm. long, filiform, the racemes lax, 2–10-flowered; bracts ovate, glandular-dentate, glabrous, caducous; calyx tube broadly turbinate, 2.5 mm. long, the lobes broadly ovate, obtuse or acute, shorter than the tube, often serrulate; petals rose-purple; fruit broadly obovate, glabrous, conspicuously gland-dotted.

Called “escoba colorada” in Yucatan, and the Maya name is reported as “mucuyche.” The fruits exude a yellow juice when crushed between the fingers. The roots with lime are reported to yield a red dye, and a yellow coloring substance also is extracted from them. Bunches of the stems and branches are much used about the houses as rough brooms or brushes, hence the common name “escobilla” applied to this plant as well as to other members of the genus. *D. nutans* occurs in great abundance in central Guatemala, often forming a dense growth in cornfields, where the myriads of slender, red or purple stems are conspicuous. *D. nutans* and *D. diffusa* usually have been treated as distinct species, but the key characters by which Rydberg separates them are worthless, and we have found no better ones.

Dalea sericea Lag. Gen. & Sp. Nov. 23. 1816. *Parosela sericea* Rose, Contr. U. S. Nat. Herb. 10: 105. 1906. *Silvina morada*; *Plumerito*.

Brushy slopes, often in pine or oak forest, 1,000–2,200 meters; Alta Verapaz; Jalapa; Guatemala; Sacatepéquez; Chimaltenango; Huehuetenango; Quezaltenango. Southern Mexico; Honduras.

Plants usually perennial and somewhat woody, mostly less than a meter high, erect or decumbent, often much branched from the base, the stems sericeous or pilose; stipules subulate-filiform, 1 cm. long or more; leaflets 7–11, elliptic, acute at each end, cuspidate-acuminate at the apex, 1–2 cm. long, sericeous on both surfaces, obscurely gland-dotted; peduncles terminal, 15–40 cm. long, scape-like, the spikes very dense, 2–7 cm. long, 1.5–2 cm. thick, brownish in age; bracts lanceolate, attenuate, sericeous; calyx tube 3 mm. long, sericeous, the lobes filiform from a broad base, much longer than the tube, plumose; petals violet; fruit sericeous.

Dalea tomentosa (Cav.) Willd. Sp. Pl. 3: 1341. 1803. *Psoralea tomentosa* Cav. Icon. Pl. 3: 21. pl. 240. 1794. *D. verbenacea* Schlecht. & Cham. Linnaea 5: 579. 1830. *D. psoraleoides* Moric. Mém. Soc. Genève 6: 533. 1833. *Parosela psoraleoides* Rose, Contr. U. S. Nat. Herb. 10: 104. 1906. *Parosela tomentosa* Rose, Contr. U. S. Nat. Herb. 12: 273. 1909. *D. vulcanicola* Donn. Smith, Bot. Gaz. 56: 52. 1913 (type from Volcán de Atitlán, Sololá, Kellerman 5780). (?)*D. querceti* Harms, Verh. Bot. Ver. Brandenb. 65: 89. 1923 (type from Barranco de Zapote, near Guatemala, Seler 2489). *Taraicito*; *Plumerito* (fide Aguilar).

Rather dry, brushy or grassy, often rocky slopes or plains, often in pine-oak forest, sometimes on gravel bars along streams, 600–2,050 meters, rarely at even lower elevations; Izabal (near Los Amates, along Río Motagua, the seeds probably carried down by the stream); Baja Verapaz; Zacapa; Chiquimula; Jalapa; Jutiapa; Guatemala; Sacatepéquez; Chimaltenango; Sololá; Huehuetenango. Southern Mexico; Salvador; Honduras.

A rather stout shrub a meter high or less, sparsely or rather densely branched, densely leafy, the stems densely villous, not glandular; stipules subulate, 5 mm. long; leaflets 3–9, oblong-obovate or elliptic, 5–12 mm. long, obtuse or subacute and cuspidate-mucronate, densely sericeous on both surfaces; spikes sessile or short-pedunculate, terminating the branches, very dense, 1–4 cm. long, 8 mm. thick, tapering upward; bracts lanceolate, acuminate, persistent, longer than the buds, sericeous; calyx tube campanulate, 2 mm. long, villous, the lobes lance-subulate, shorter than the tube; petals lilac-pink; fruit pubescent at the apex.

Rydberg, like some other authors, treats *D. tomentosa* and *D. psoraleoides* as distinct species, but the characters by which he affects to separate them are inconstant and worthless.

Dalea versicolor Zucc. Flora 15, pt. 2, Beibl. 1: 69. 1832. *Parosela versicolor* Rydb. N. Amer. Fl. 24: 102. 1920. *P. tsugoides* Rydb. loc. cit.

Usually in moist or dry, pine-oak forest or on bare rocky hill-sides, sometimes on gravel bars along streams, 1,500–2,500 meters; Jalapa; Guatemala; Sacatepéquez; Chimaltenango; Quiché; Huehuetenango. Southern Mexico.

A shrub a meter high or less, often densely branched, very leafy, the stems villous; stipules subulate, 3 mm. long; leaflets 13–21, oblong, 2–7 mm. long, rounded at the apex, usually glabrous above, pilose and black-dotted beneath, often involute; spikes terminal, short-pedunculate, 2–5 cm. long, 1.5 cm. broad; bracts narrowly lanceolate, attenuate, pilose and gland-dotted; calyx tube 3 mm. long, pilose, with glands between the costae; petals rose-purple; fruit densely pubescent and glandular-punctate above, glabrate below.

This species is one of the small group of plants found commonly on serpentine exposures of the almost bare hillsides along the lower southern slopes of the Sierra de los Cuchumatanes, although it is by no means confined to serpentine outcrops.

Dalea vulneraria Oerst. Vid. Medd. Kjöbenhavn 1853: 4. 1853. *Parosela vulneraria* Rydb. N. Amer. Fl. 24: 115. 1920. *Tarayín* (fide Aguilar); *Zulcate* (Petén, fide Lundell).

Dry to wet, brushy plains and hillsides, often in rocky places, frequent in pine-oak forest, sometimes on gravel bars along streams, 2,000 meters or less; Petén(?); Zacapa; Jalapa; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Huehuetenango. Southern Mexico; Salvador and Honduras to Costa Rica, the type from Nicaragua.

A branched erect shrub, commonly about a meter high, the branches usually densely villosulous, sparsely gland-dotted; stipules filiform-subulate, 4–5 mm. long; leaf rachis scarcely marginate; leaflets 9–15, oval, rounded or retuse at the apex, 8–12 mm. long, villous on both surfaces, paler and gland-dotted beneath; spikes mostly 1–2 cm. long, axillary and subsessile, some of them usually terminal and short-pedunculate; bracts lance-ovate, acuminate, equaling or exceeding the calyx, deciduous, pubescent and bearing a few glands; calyx tube almost glabrous, 2 mm. long, glandular between the costae, the lobes filiform from a triangular base, plumose, the lowest 3 mm. long, the others shorter; petals brown-purple; fruit densely pilose near the apex.

This has been reported from Guatemala as *D. phymatodes* Willd. It is rather questionable whether *D. vulneraria* as represented in Guatemala is sufficiently distinct from *D. domingensis*. The two belong to a distinct group, easily recognized as distinct from other species of *Dalea*. In North America, Rydberg recognized no less than 11 species of this alliance, all of which could probably be treated as constituting a single species without serious misrepresentation of their true status.

Plants of the genus *Desmodium*, native in the East Indies, where they are used as a source of rotenone, have been grown experimentally in Guatemala and have been offered for sale by the Dirección de Agricultura. They are also grown to some extent at Finca Montevideo on the slopes of Volcan de Fuego. They are reported as having been planted on a rather large scale in the lowlands of Alta Verapaz. Rotenone is one of the most efficient insecticides for use on growing plants, poisoning various insects but having no deleterious effects on the plants.

DESMODIUM Desvaux

Annual or perennial herbs, erect to decumbent or prostrate, rarely scandent, sometimes erect shrubs, the pubescence often of uncinata hairs; leaves stipulate, usually 3-foliate, sometimes 1-foliate; flowers small or rather large and showy, pink, purple, or occasionally white, generally racemose or paniculate; calyx tube short, the teeth more or less united to form 2 lips, the upper lip 2-dentate, the lower teeth acute or attenuate; standard petal oblong to ovate or orbicular, narrowed or rarely unguiculate at the base; wings obliquely oblong, the keel almost straight, obtuse; stamens monadelphous or diadelphous, the anthers all alike; ovules 2-many; fruit a loment, flat, composed of 2-several articulations, the joints usually coriaceous and pubescent, generally with small uncinata hairs, usually indehiscent, readily separating from one another.

Species about 150, in temperate and tropical regions of both hemispheres. A few others are known from southern Central America. The species are more numerous in Mexico than in any other part of the earth. The genus has not been monographed in recent years and the nomenclature is in an unsatisfactory state, except for the most common weedy species and certain small groups that have received monographic attention. Because of the abundant small uncinata hairs on most species, the leaves and stems adhere readily to clothing and the pods cling most tenaciously to clothing, to any part of the human body, and to the feathers and hair of various animals, thus ensuring wide dispersal of the plants.

Flowers solitary or in clusters of 2-4, axillary or opposite the leaves; plants small, creeping; leaflets mostly 1 cm. long or shorter.....*D. triflorum*.

Flowers paniculate or racemose, the racemes usually elongate, rarely short and dense.

Flowers in very short and dense, terminal racemes; calyx densely long-pilose.
D. barbatum.

Flowers in elongate, often paniculate, usually open racemes; calyx not long-pilose.

Leaves all or nearly all 1-foliate, appearing simple.

Leaflets obtuse or subacute, chiefly oblong or elliptic, abundantly pubescent beneath.....*D. cubense*.

Leaflets mostly long-attenuate to the apex, linear to lanceolate or oblong-lanceolate, glabrous or nearly so.

Loment sessile in the calyx.....*D. angustifolium*.

Loment conspicuously stipitate within the calyx.....*D. psilophyllum*.

Leaves all or nearly all 3-foliolate, some of the lowest sometimes 1-foliolate.

Loment and its joints straight or nearly so along the upper margin, the lower margin deeply crenate-lobate; plants low and herbaceous throughout or merely suffrutescent below, never scandent.

Plants erect or ascending; leaflets mostly oblong to oval or suborbicular, rounded or very obtuse at the apex, rarely subacute.

Lower margin of the loment crenate-lobate almost to the upper edge; bracts small and inconspicuous; leaflets pale beneath, the pubescence usually not closely appressed.....*D. canum*.

Lower margin of the loment crenate-lobate to about the middle; bracts rather large and conspicuous; leaflets green beneath, the pubescence very closely appressed.....*D. adscendens*.

Plants procumbent and trailing, rooting at the nodes, at least at the lower ones; leaflets ovate or rhombic-ovate, acute or acutish.

Loment with 4-6 joints; corolla white.....*D. affine*.

Loment with usually 2, sometimes 3 joints; corolla purple or pink.

Loment sessile or nearly so.....*D. Wyderianum*.

Loment long-stipitate.....*D. axillare*.

Loment more or less crenate-lobate along both margins, the crenations usually equally deep on both edges, sometimes deeper below; plants herbaceous or often woody, frequently scandent.

Joints of the loment 12-25 mm. wide, deeply and narrowly indented on the upper edge; plants scandent.

Leaflets glabrous on the upper surface.....*D. metallicum*.

Leaflets abundantly pubescent on the upper surface, rough to the touch.

Joints of the loment about 2.5 cm. wide.....*D. macrodesmum*.

Joints of the loment usually 1-1.5 cm. wide.....*D. infractum*.

Joints of the loment 8 mm. wide or narrower, usually much less than 8 mm. wide, not indented on the upper margin or rarely slightly indented; plants rarely scandent.

Loment with usually only 1 fertile joint, this shallowly indented on the upper edge.....*D. glabrum*.

Loment with normally 2 or more fertile joints, these not indented on the upper edge.

Plants woody throughout or nearly so; erect shrubs usually 1-3 meters high.

Joints of the loment 8-15 mm. long, much longer than broad.

D. Skinneri.

Joints of the loment mostly less than 7 mm. long, often much shorter, usually but little longer than broad.

Loment glabrous or nearly so; leaflets glabrate beneath.

D. orbiculare.

Loment densely pubescent; leaflets densely pilose beneath.

Leaflets acute or acuminate.....*D. amplifolium*.

Leaflets obtuse or rounded at the apex.

- Joints of the loment more or less folded together; pubescence of the lower leaf surface of lax, often spreading, scarcely appressed hairs. *D. plicatum*.
- Joints of the loment not folded, all extended in one plane; pubescence of the lower leaf surface of closely or laxly appressed hairs.
- Joints of the loment 3.5 mm. wide, evidently asymmetric, the pubescence of spreading hairs.
D. cajanifolium.
- Joints of the loment scarcely 2.5 mm. wide, symmetric or nearly so, the pubescence of minute, closely appressed hairs. *D. nicaraguense*.
- Plants herbaceous throughout, or suffrutescent only near the base, often decumbent or prostrate, sometimes more or less scandent.
- Joints of the loment narrowly oblong, more than twice as long as broad. *D. scorpiurus*.
- Joints of the loment broader, mostly elliptic to orbicular, less than twice as long as broad.
- Joints of the loment normally 2. *D. obtusum*.
- Joints of the loment normally more than 2, commonly 4-8 or more.
- Plants mostly annual, perennial in *D. retinens*; stipules subulate or nearly so, at most 1.2 mm. wide, green.
- Joints of the loment with margins involute and revolute, the loment thus appearing twisted. . . . *D. procumbens*.
- Joints of the loment with only somewhat sinuate margins, the loment not appearing twisted.
- Plants annual; joints of the loment sessile, more or less densely uncinulate-hispidulous; leaves thinly membranaceous, the veins not conspicuously reticulate-thickened. *D. neomexicanum*.
- Plants perennial; joints of the loment stipitate, glabrate to sparsely uncinulate-pilosulous; leaves firmly membranous to subchartaceous, the veins conspicuously reticulate-thickened. *D. retinens*.
- Plants perennial; stipules commonly much broader than subulate, 2 mm. or more wide, often semiovate, frequently dry and brown.
- Margins of the joints of the loment conspicuously revolute and involute, the loment thus appearing twisted, except sometimes when very mature.
- Loment long-stipitate within the calyx. . . . *D. tenuipes*.
- Loment sessile or on a very short stipe.
- Joints of the loment about 2.5 mm. wide.
- Joints of the loment mostly glabrous at maturity; stems sparsely hirsute or uncinulate-hirtellous.
D. distortum.
- Joints of the loment densely uncinulate-puberulent; stems densely brown-hirsute. *D. hirsutum*.
- Joints of the loment 3 mm. wide or wider.
D. tortuosum.

Margins of the joints of the loment neither revolute nor involute, except when very young, the loment never appearing twisted.

Stems glabrous or nearly so except in the inflorescence.

D. Palmeri.

Stems densely pilose or uncinat-pilose throughout or at least in the upper nodes just below the inflorescence.

Leaflets orbicular or nearly so, about as broad as long.

Stipules about 18 mm. long; terminal leaflet about 7 cm. long and wide. *D. Seleri.*

Stipules about 6 mm. long; terminal leaflet about 1.5-2.5 cm. long and wide. *D. molliculum.*

Leaflets elliptic or broadly oval to broadly ovate, ovate, oblong, or narrowly oblong-lanceolate, much longer than broad.

Leaflets narrowly oblong to linear-lanceolate.

Loment subsessile, the stipe shorter than the calyx; plants more or less scandent.

Joints of the loment 3.5-4.5 mm. long; stipules 1-1.2 cm. long, 0.2-0.5 cm. wide; pubescence of stems white to gray; lower surface of leaflets loosely long-pilose. *D. Johnstonii.*

Joints of the loment 2-2.5 mm. long; stipules 4-5 mm. long; pubescence of stems rufous-brown; lower surface of leaflets subcanescent. *D. prehensile.*

Loment conspicuously stipitate; plants erect.

D. Hartwegianum.

Leaflets broadly elliptic, oval, or broadly ovate.

Principal nodes of the stems very densely pilose with white, straight, not uncinat, spreading or retrorse hairs; leaflets very densely and softly pilose on both surfaces. *D. strobilaceum.*

Principal nodes of the stems sparsely or densely pilose with hairs of various types, but part or all of the hairs uncinat-tipped.

Stems subterete, densely white-pilose when young, uncinat-puberulent in age; veins impressed on the upper surface of the leaflets; joints of the loment normally 5-6.

D. Mazonii.

Stems trigonous, not densely white-pilose; veins not impressed on the upper surface of the leaflets; joints of the loment usually 7-10. *D. intortum.*

Desmodium adscendens (Swartz) DC. Prodr. 2: 332. 1825.

Hedysarum adscendens Swartz, Prodr. Veg. Ind. Occ. 106. 1788.

Meibomia adscendens Kuntze, Rev. Gen. 105. 1891. *Pegapega* (fide Aguilar).

Moist or wet thickets or forest, often in pine or mixed forest or in savannas, sometimes on sandbars along streams, 1,500 meters or lower, most frequent at low elevations; Petén; Alta Verapaz; Izabal; Chiquimula; Santa Rosa; Escuintla; Suchitupéquez; Retalhuleu; Quezaltenango; San Marcos; Huehuetenango. Mexico; British Honduras to Panama; West Indies; South America.

Plants perennial, often much branched from the base, herbaceous, erect or procumbent, sometimes rooting from the lower nodes, the stems branched, mostly 50 cm. long or less, slender, pilose with spreading or appressed, white hairs; stipules lanceolate, acuminate, equaling or shorter than the petioles; leaflets 3, elliptic to rounded-obovate or suborbicular, 1-3 cm. long, rounded at the apex, glabrous above, paler beneath, appressed-pilose; racemes slender, usually simple, 5-20 cm. long, many-flowered, the pedicels filiform, ascending, 7-15 mm. long, puberulent; bracts lanceolate, acuminate, pilose, deciduous, about 7 mm. long; calyx 5 mm. long, deeply lobate, the teeth linear-lanceolate; corolla usually purple or pink, rarely white, twice as long as the calyx; loment 3-6-jointed, 2 cm. long or shorter, the upper margin continuous, the lower one crenate to about the middle, the joints oblong, pubescent.

Called "mozote" in Honduras.

Desmodium affine Schlecht. *Linnaea* 12: 312. 1838. *D. albi-florum* Salzm. ex Benth. in Mart. Fl. Bras. 15, pt. 1: 99. 1859.

Dense wet mixed lowland forest, 1,200 meters or usually at lower elevations; Zacapa; Santa Rosa; Retalhuleu; Huehuetenango. Southern Mexico; Honduras; Salvador; Greater Antilles; South America.

Plants procumbent or almost prostrate, the stems slender, elongate, rooting at the lower nodes, pilose with long spreading white hairs and puberulent, or in age glabrate; stipules lanceolate, subcordate at the base; leaves on long slender petioles, the leaflets 3, ovate or broadly rhombic-ovate, mostly 5-8 cm. long, acute or narrowed to a subobtuse apex, subtruncate to broadly cuneate at the base, rather thin, glabrous above, pilose beneath on the nerves or glabrate; racemes slender and lax, 5-15 cm. long, few-many-flowered, the filiform pedicels 8-20 mm. long; bracts ovate, acuminate, about equaling the calyx, soon deciduous; calyx 3 mm. long, the teeth lanceolate; corolla white, somewhat longer than the calyx; loment sessile, 4-6-articulate, the upper margin almost straight and continuous, the lower one deeply crenate-lobate, the joints broadly oblong, about 6 mm. long, densely uncinatopuberulent.

Desmodium amplifolium Hemsl. *Biol. Centr. Amer. Bot.* 1: 274. 1880.

Chiefly in open, oak or pine forest, sometimes in rocky places, 1,400-2,400 meters; El Progreso; Zacapa; Jalapa; Santa Rosa; Chimaltenango; Huehuetenango; San Marcos. Southern Mexico.

A stout, sparsely branched or almost simple, erect shrub 1-3 meters high, the young branches terete, very densely pilose with soft, white, not uncinat, spreading or reflexed hairs, sometimes glabrate in age; stipules dry and brown, oblong-ovate, about 12 mm. long, densely sericeous outside, usually caducous; leaves borne on stout petioles, the 3 leaflets rather thick, mostly ovate-oblong or lance-oblong, sometimes ovate, 5-11 cm. long, acute to long-acuminate, rounded at the base, rather densely short-pilose above, the veins usually impressed, pale beneath and densely sericeous-pilose, the nerves and veins elevated; flowers bright rose-purple, in usually very dense racemes at the ends of the branches, or some of the racemes axillary, mostly 10 cm. long or shorter; bracts very conspicuous on the young flower spikes but soon deciduous, dry, brown, striate, ovate or elliptic, acuminate, 12-15 mm. long, glabrate; pedicels slender, pubescent, 6-8 mm. long or shorter; calyx pale, glabrate, the teeth unequal, triangular, acute or acuminate; corolla about 7 mm. long; loment short-stipitate, deeply crenate-lobate along both margins, puberulent or almost glabrous, the joints about 5, rounded-elliptic, sometimes slightly revolute when young, about 3 mm. wide.

Desmodium angustifolium (HBK.) DC. Prodr. 2: 328. 1825. *Hedysarum angustifolium* HBK. Nov. Gen. & Sp. 6: 404. 1823. *Lengua de culebra* (Escuintla); *Burriñcito* (Escuintla); *Escorpión de escoba* (fide Aguilar).

Open grassy fields or hillsides, often in rocky places, moist or dry thickets, or in open, pine or oak forest, 100-2,000 meters; El Progreso; Zacapa; Jalapa; Jutiapa; Escuintla; Guatemala; Sacatepéquez; Huehuetenango. Mexico; Salvador; Costa Rica; Colombia.

A slender strict erect annual, a meter high or usually lower, simple or sparsely branched, rather sparsely leafy, the branches terete, erect, brown or reddish, sparsely and finely puberulent or glabrous; stipules very small, narrow, inconspicuous, persistent; leaves 1-foliate, appearing simple, on stout petioles 8 mm. long or shorter, subcoriaceous, linear or lance-linear, 3.5-11 cm. long, mostly 3-7 mm. wide, narrowed to an obtuse apex, obtuse at the base, glabrous or sparsely hirtellous on the nerves, the venation elevated and reticulate; racemes lax, short or elongate, simple or usually forming a narrow terminal panicle, the slender branches finely puberulent or almost glabrous; flowers purple, slender-pedicellate, the bracts lanceolate, acuminate, small and inconspicuous; loment sessile or nearly so, usually 5-7-articulate, puberulent and sparsely short-hispidulous, not twisted, shallowly crenate-lobate on both margins, the joints symmetric, 2.5 mm. wide.

Called "lengua de pájaro" in Salvador. Although widely distributed and not uncommon in Guatemala, the plant seldom occurs in any abundance, and the plants are so slender that they are not conspicuous. The Guatemalan material of this species is referable to var. *typicum* (see Schubert, Contr. Gray Herb. 129: 27. 1940).

Desmodium axillare (Swartz) DC. Prodr. 2: 333. 1825. *Hedysarum axillare* Swartz, Prodr. Veg. Ind. Occ. 107. 1788.

Plants perennial, herbaceous, the stems slender, prostrate or procumbent, rooting at the nodes; leaves on very long, slender petioles, 3-foliolate; stipules connate for half their length or less, deciduous; bracts caducous; flowers in long-pedunculate, lax, usually few-flowered, axillary racemes, purple or lavender; calyx uncinulate-puberulent over the whole surface and with stout straight longer hairs on the teeth; corolla longer than the calyx; loment usually 2-articulate, stipitate, the upper suture continuous and straight, the lower deeply lobate.

This species has been treated in detail by Miss Schubert (Contr. Gray Herb. 135: 79. 1941), who recognizes three varieties, all of which are found in Guatemala. These are separated as follows:

Stems with long dense pubescence of straight hairs; leaflets ovate or elliptic-ovate, long-pilose beneath, acute or gradually acuminate or usually long-acuminate.
var. *acutifolium*.

Stems with rather inconspicuous pubescence of short uncinuate hairs; leaves short-pilose beneath.

Leaflets rhombic, rhombic-ovate, or rhombic-orbicular, obtuse or rounded at the apex; stipe of the loment 3-4.5 mm. long. var. *genuinum*.

Leaflets ovate, rather abruptly short-acuminate; stipe of the fruit 4.5-8 mm. long. var. *Sindenistii*.

Desmodium axillare var. *acutifolium* (Kuntze) Urban, Symb. Antill. 4: 292. 1905. *Meibomia axillaris* var. *acutifolia* Kuntze, Rev. Gen. 195. 1891. *M. prorepens* Blake, Contr. U. S. Nat. Herb. 24: 6. 1922 (type from Los Amates, Izabal, S. F. Blake 7718).

Moist or wet thickets or forest, sometimes in pine forest, 1,000 meters or lower; Izabal; Suchitepéquez; Sololá. British Honduras to Panama; West Indies; South America.

Called "pega pega" in Oaxaca.

Desmodium axillare var. *genuinum* Urban, Symb. Antill. 2: 303. 1900. *Mozote*; *Pega pega*.

Moist or wet thickets or forest, often in open weedy places, frequently a weed in banana plantations, mostly at 300 meters or less; Petén; Alta Verapaz; Izabal. Southern Mexico; British Honduras to Costa Rica and Panama, along the Atlantic coast; West Indies; South America.

Leaflets 4-9 cm. long; stipules 5-6 mm. long; bracts ovate-acuminate, 2.5-4.5 mm. long; calyx 2.5-3.5 mm. long; corolla 4-4.5 mm. long; loment uncinuate-pubescent, the joints usually 2, sometimes 3, variable in size but mostly 6-10 mm. long.

Called "cadillo" in Veracruz.

Descriptions of the various varieties need not be given here, since the three forms are much alike except for the characters given in the key, which separate them easily and definitely.

Desmodium axillare var. **Sintenisii** Urban, Symb. Antill. 2: 303. 1900. *Meibomia albidia* Blake, Contr. U. S. Nat. Herb. 24: 5. 1922 (type from Quebradas, Izabal, *S. F. Blake* 7510).

Moist or wet forest or thickets, 200 meters or lower; Petén; Izabal; Huehuetenango. British Honduras; Honduras; Greater Antilles; South America.

Desmodium barbatum (L.) Benth. & Oerst. Vid. Medd. Kjoebenhavn 1853: 18. 1853. *Hedysarum barbatum* L. Syst. Nat. ed. 10. 1170. 1759. *Mozote*.

Open, dry or wet, often rocky plains and hillsides, frequently in pine forest or savannas, 1,500 meters or less; Petén; Alta Verapaz; Izabal; Zacapa; Jalapa; Jutiapa; Santa Rosa; Guatemala; Suchitepéquez; Huehuetenango. Mexico; British Honduras to Salvador and Panama; West Indies; South America.

Plants erect or ascending, perennial, often suffrutescent below, 50 cm. high or less, the stems stiff and stout, rather densely leafy, densely pilose; stipules narrowly lanceolate, long-acuminate, half as long as the petioles; petioles slender, shorter than the leaflets; leaflets 3, oblong to oval or elliptic-obovate, mostly 1.5–3.5 cm. long, rounded at the apex, glabrous above or nearly so, densely appressed-pilose beneath and often reticulate-veined; racemes terminal, dense, 1–3 cm. long, many-flowered, the pedicels very slender, 2–3 times as long as the ovate-lanceolate acuminate bracts; calyx nutant in age, pilose with long brown hairs; corolla purple or bluish purple, little longer than the calyx; loment 2–4-articulate, the upper margin continuous, the lower one deeply crenate, the joints densely pilose and puberulent.

Sometimes called “caragüillo” in Salvador. This is a common weedy plant in many regions, particularly in the North Coast. The hairs are straight, not uncinatate as in many species.

Desmodium cajanifolium (HBK.) DC. Prodr. 2: 331. 1825. *Hedysarum cajanifolium* HBK. Nov. Gen. & Sp. 6: 525. pl. 598. 1824. *Engorda-caballo*.

Rocky brushy hillsides or rocky stream beds, sometimes in open pine forest, 1,000 meters or less; Santa Rosa; Escuintla; Retalhuleu; Quezaltenango; Huehuetenango. Southern Mexico; Costa Rica; Panama; South America.

A rather stout, erect shrub 1.5–2.5 meters high, sparsely or abundantly branched, the stems terete, finely pubescent or puberulent with mostly uncinatate hairs, sometimes also pilose; leaves on stout petioles 1.5–4 cm. long; stipules 3–7 mm. long, persistent; leaflets 3, ovate to broadly elliptic or almost rounded, mostly 5–9 cm. long, obtuse or rounded at the apex, densely puberulent to glabrate above, pale beneath, densely soft-pilose with spreading or subappressed hairs, the vena-

tion prominent; inflorescence often large, racemose-paniculate, the branches uncinat-pubescent; bracts small, deciduous, the slender pedicels 4-5 mm. long; calyx 2.5-3 mm. long; petals rose-purple, the standard 7 mm. long; loment sessile, the joints about 6, semiorbicular to suborbicular, 4.5-5 mm. long, pubescent with short spreading uncinulate hairs, the isthmus between the joints very narrow.

Desmodium canum (J. F. Gmel.) Schinz & Thellung, Mém. Soc. Neuchât. Sci. Nat. 5: 371. 1913. *Hedysarum frutescens* Jacq. Hort. Vindob. 3: 47. pl. 89. 1776, not L. 1753. *H. canum* J. F. Gmel. Syst. 1124. 1791. *H. supinum* Swartz, Prodr. Veg. Ind. Occ. 196. 1788, not Vill., 1779. *H. incanum* Swartz, op. cit. 107. 1788, not Thunb., 1784. *D. supinum* DC. Prodr. 2: 322. 1825. *D. incanum* DC. loc. cit. *Meibomia incana* Cook & Collins, Contr. U. S. Nat. Herb. 8: 189. 1903. *M. supina* Britton, Ann. N. Y. Acad. Sci. 7: 83. 1892. *D. frutescens* Schindl. Repert. Sp. Nov. 20: 9. 1924. *Mozote: Copal de coche* (Jalapa); *Martín* (Alta Verapaz); *Escorpionera* (fide Aguilar); *Zacate bucho* (fide Blake).

Moist or wet thickets or open banks or fields, sometimes in open, pine or oak forest, frequently a weed in waste ground, 1,400 meters or lower, most plentiful at low elevations; Petén; Alta Verapaz; Izabal; Zacapa; Jalapa; Jutiapa; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu; Quezaltenango. Mexico; British Honduras to Salvador and Panama; West Indies; South America; tropical Africa.

Plants perennial, usually herbaceous, sometimes suffrutescent, a meter high or lower, erect or ascending, sparsely branched, the stems puberulent or short-pilose, often dark red; stipules lanceolate, acuminate; leaflets 3, commonly elliptic or oval, 2-7 cm. long, obtuse or rounded at the apex or subacute, glabrous above or nearly so, paler beneath, pubescent or strigose; racemes slender, lax, 5-15 cm. long, many-flowered, the bracts linear-lanceolate, shorter than the pedicels, deciduous; pedicels 6-12 mm. long; calyx about 3 mm. long, the teeth ovate-lanceolate, acute; corolla purple or purplish, bluish in withering, 2-3 times as long as the calyx; loment 3-8-articulate, 3 cm. long or shorter, the upper margin continuous, the lower one deeply crenate-lobate; joints broadly oblong, densely pubescent with short uncinulate hairs.

One of the commonest weedy plants of many parts of the Central American lowlands.

Desmodium cubense Griseb. Cat. Pl. Cub. 73. 1866.

In savannas, 200 meters or less; Petén (near La Libertad, several times collected). Cuba.

Perennial from a thick woody root, the stems erect or ascending, mostly simple, 50 cm. high or less, subterete, striate, green, rather densely uncinat-hirtellous; stipules small, subulate, persistent; leaves 1-foliate, appearing simple, chartaceous, on a petiole 3 mm. long or less, elliptic to narrowly oblong, 1.5-3 cm. long,

5-14 mm. wide, obtuse or rounded and apiculate at the apex, obtuse or rounded at the base, glabrous above or nearly so, rather densely uncinat-pubescent beneath, the venation strongly elevated and reticulate; racemes terminal, long-pedunculate, slender, strict, lax, many-flowered, simple, mostly 10-15 cm. long, the bracts inconspicuous, subulate, the filiform pedicels about 5 mm. long; calyx 3 mm. long, green, uncinat-puberulent, the teeth lanceolate or ovate, acute or acuminate; corolla purple; loment short-stipitate, 2-4-articulate, crenate-lobate almost to the middle, uncinat-puberulent, the joints oblong-elliptic, 4 mm. long, 2.5 mm. wide, almost symmetric.

Desmodium distortum (Aubl.) Macbride, Field Mus. Bot. 8: 101. 1930. *Hedysarum distortum* Aubl. Pl. Guian. 774. 1775. *H. asperum* Poir. in Lam. Encycl. 6: 408. 1804. *D. asperum* Desv. Journ. de Bot. 1: 122. 1813. *Meibomia distorta* Schindl. Repert. Sp. Nov. 22: 281. 1926. *D. asperum* var. *Michelii* Schindl. in Loes. Verh. Bot. Ver. Brandenb. 65: 91. 1923, hyponym (type from Palo Verde, Volcán de Fuego, Chimaltenango, *Seler* 2421). *M. aspera* var. *Michelii* Schindl. Repert. Sp. Nov. 22: 282. 1926.

Moist or dry thickets, on plains or hillsides, often in weedy fields, 1,800 meters or lower, most common below 1,000 meters; Alta Vera-paz; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez. Southern Mexico; Salvador; Costa Rica; Panama; West Indies; South America.

Plants perennial, erect, herbaceous throughout or rarely suffrutescent below, the stems simple or sparsely branched, subterete, striate, uncinat-hirtellous or hirsute; leaves 3-foliate, on petioles 2-10 cm. long; stipules often amplexicaul, 10-18 mm. long, usually greenish and often long-persistent; leaflets elliptic-ovate to ovate, mostly 5-9 cm. long, usually rounded or very obtuse at the apex, green above, appressed-pilose and uncinulate-puberulent, softly appressed-pilose beneath and prominently reticulate-veined; inflorescence racemose-paniculate, often very large and much branched, the branches puberulent and pilose with spreading hairs; bracts small and inconspicuous; calyx 2.5-3 mm. long; petals purple, the standard 5 mm. long; loment stipitate, with 6 or fewer joints, the joints orbicular, about 2.5 mm. long and wide, puberulent or the upper ones glabrous.

Sometimes known in Salvador by the names "pegapega" and "alfalfa montés."

Desmodium glabrum (Mill.) DC. Prodr. 2: 338. 1825. *Hedysarum glabrum* Mill. Gard. Dict. ed. 8. no. 12. 1768. *D. molle* DC. Prodr. 2: 332. 1825. *H. molle* Vahl, Symb. Bot. 2: 83. 1791. *Meibomia mollis* Kuntze, Rev. Gen. 198. 1891.

Moist thickets, 900 meters or less; Chiquimula; Jutiapa (near Jutiapa); Santa Rosa (southeast of Chiquimulilla). Southern Mexico; Costa Rica; West Indies; South America.

A stout erect perennial herb a meter high, often much branched, the stems densely and finely pubescent with uncinat hairs; leaves on petioles 3.5 cm. long or shorter; leaflets 3, ovate to lanceolate, 2.5–7 cm. long, acute or acuminate, rounded or subcordate at the base, thinly puberulent or short-pilose above, densely velutinous-pilose beneath; stipules 4 mm. long, triangular-subulate; racemes long and slender, rather lax, many-flowered, paniculate, often forming very large, open panicles, the slender pedicels 6 mm. long; bracts short, filiform, villous, deciduous; calyx lobate almost to the base, the lobes lanceolate, puberulent; corolla greenish yellow, 4 mm. long; laments sessile, usually 4-articulate, all the joints except the terminal one abortive, twisted, densely puberulent; terminal joint elliptic-oblong, 7–9 mm. long, slightly narrowed at each end, with a shallow sinus on the upper edge, densely and minutely pubescent, the valves thin, membranous.

Desmodium Hartwegianum Hemsl. Biol. Centr. Amer. Bot. 1: 279. 1880. *Meibomia Hartwegiana* Kuntze, Rev. Gen. 198. 1891.

A species of Mexico, represented in Guatemala by the following variety:

Desmodium Hartwegianum var. *amans* (Wats.) Schubert, Contr. Gray Herb. 135: 93. 1941. *D. amans* Wats. Proc. Amer. Acad. 26: 135. 1891. *Pegapega*.

Open, oak or pine forest, often in rocky places, 1,000–1,500 meters; Zacapa (Sierra de las Minas); Guatemala; Huehuetenango. Central and southern Mexico.

An erect perennial herb, the stems usually simple, a meter high or usually lower, subterete, uncinat-puberulent and uncinat-hispidulous; leaves 3-foliolate, on petioles 3.5 cm. long or shorter; stipules ovate-lanceolate, long-acuminate, brown and dry, striate, more or less persistent; leaflets narrowly elliptic to oblong or lance-oblong, mostly 3–6 cm. long and 1–2 cm. wide, somewhat narrowed to an obtuse apex, rounded at the base, appressed-pilose on the upper surface and more densely so beneath with long soft hairs, the venation strongly elevated beneath; inflorescence simple or sparsely branched and paniculate, strict, laxly many-flowered, the branches densely uncinat-puberulent; bracts ovate, long-acuminate, 5–12 mm. long, deciduous; calyx densely puberulent, 3–6 mm. long; corolla rose-purple, the standard 5–10 mm. long; loment 5–7-articulate, stipitate, deeply crenate-lobate along both margins, the joints orbicular to subelliptic, densely uncinat-pubescent, 3–5 mm. long, 2.5–4 mm. wide.

Desmodium hirsutum Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 186. 1843.

Thickets, 900 meters or less; Santa Rosa. Mexico.

Plants perennial, herbaceous, the stems erect, mostly simple, 1–3 meters tall, subterete, striate, densely brown-hirsute and uncinat-hirtellous; leaves 3-foliolate, on petioles 3–11 cm. long, the petioles densely brown-hirsute and uncinat-hirtellous; stipules often amplexicaul, 10–17 mm. long, striate, usually greenish and often long-persistent; leaflets elliptic-ovate to ovate, mostly 7.5–11 cm. long,

rounded or obtuse at the apex, green above, appressed-pilose and sparsely uncinulate-puberulent, softly appressed-pilose beneath on the midrib and lateral nerves, uncinulate-puberulent on the surface and prominently reticulate-veined; inflorescence racemose-paniculate, often large and much branched, the branches glandular-puberulent and pilose with spreading hairs; bracts small and inconspicuous; calyx about 2 mm. long; petals purple, the standard 5 mm. long; loment stipitate, with 6 or fewer joints, the joints suborbicular, about 3 mm. long and 2.5-3 mm. wide, densely uncinulate-puberulent.

This species appears too close to *D. distortum* (Aubl.) Macbr. and it may be found to be conspecific with that species, when more material has been collected.

Desmodium infractum DC. Prodr. 2: 330. 1825. *D. Barclayi* Benth. Bot. Voy. Sulph. 83. 1844 (type probably from Nicaragua). *Nephromeria Barclayi* Schindl. Repert. Sp. Nov. 20: 282. 1924. *Meibomia Barclayi* Rose & Standl. Contr. U. S. Nat. Herb. 16: 216. 1913.

Moist or dry thickets, 900 meters or less; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu. Southern Mexico; Salvador; Nicaragua; Costa Rica.

A small or rather large, herbaceous vine, the stems flexuous, uncinulate-hirtellous; leaves 3-foliolate, the petioles 2-3 cm. long; leaflets thin, broadly ovate or rhombic-ovate, 2-12 cm. long, puberulent or short-pilose on both surfaces, sometimes glabrate above, somewhat paler beneath, obtuse or acute; stipules semiovate, 4 mm. long; inflorescence of terminal or axillary, sparsely branched panicles about 10 cm. long, the branches uncinulate-hirtellous, the flowers rose-purple, slender-pedicellate; calyx pale green, sparsely puberulent or glabrate, deeply dentate, the teeth ovate, acute or acuminate; loment borne on a stipe 3 mm. long, the joints usually 2, connected by a very narrow isthmus, reniform-orbicular, 9-12 mm. long and almost as wide, with an acute indentation 2 mm. deep on the upper edge, the central portion hard and lenticular, surrounded by a broad thin wing, conspicuously reticulate, glabrous except on the puberulent margins.

Called "lentejón" in Salvador.

Desmodium intortum (Mill.) Urban, Symb. Antill. 8: 292. 1920. *Hedysarum intortum* Mill. Gard. Dict. ed. 8. no. 11. 1768. *Meibomia Hjalmarsonii* Schindl. Repert. Sp. Nov. 20: 143. 1924. *D. Hjalmarsonii* Standl. Field Mus. Bot. 18: 534. 1937. *Mozote*; *Copal de coche* (Jalapa); *Pega pega*.

Moist to wet or sometimes dry thickets, frequently in rocky places, a weed in coffee plantations, or in rocky places along streams, sometimes in pine, oak, or mixed forest, 2,400 meters or lower, abundant in many regions; Alta Verapaz; Zacapa; Chiquimula; Jalapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimal-

tenango; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos; Huehuetenango. Southern Mexico; Salvador to Panama; Jamaica; South America.

Plants perennial, herbaceous throughout, usually procumbent or frequently more or less scandent, sometimes 2 meters long or more and climbing over shrubs or large herbs, the stems trigonous, densely uncinat-pubescent, often densely pilose with spreading white hairs on the lowest nodes, or sometimes glabrate below the inflorescence; leaves thin, on petioles 2-5 cm. long; stipules mostly about 7 mm. long, usually deciduous, brown, dry; leaflets 3, mostly ovate or broadly ovate, sometimes broadly elliptic, usually acute, sometimes obtuse, mostly 4-7 cm. long, rounded at the base, uncinat-puberulent or glandular-puberulent and usually appressed-pilose above but green, somewhat paler and appressed-pilose beneath; inflorescences often numerous, racemose, axillary and terminal, densely uncinat-pubescent, short or elongate, dense or usually rather lax; bracts about 8 mm. long or even larger, ovate, acuminate, very conspicuous at first but soon deciduous; pedicels mostly 6-8 mm. long; calyx puberulent, somewhat pilose on the teeth, 5 mm. long or shorter; corolla rose-purple, the standard about 9 mm. long; loment short-stipitate, with 9 or fewer joints, deeply crenate-lobate on both margins, the joints semirhomboid to semiorbicular, about 4 mm. long and 2-3 mm. wide, densely uncinat-pubescent, the loment not twisted, at least when mature.

In Salvador sometimes called "amor seco" and "zarza blanca." This is an abundant plant in the Guatemalan mountains, at middle or rather low elevations, often forming dense masses of flowers and foliage over shrubbery. When just beginning to bloom it is a showy and often handsome plant, but in age it becomes straggling and unpleasant. The leaves adhere in an annoying manner to clothing and to the arms, and the pods are quite as much of a pest as those of other species. The very ample Guatemalan material we have referred here seems remarkably uniform, although it is possible that intensive study may discover characters for dividing it. *D. Hjalmarsonii* is a form in which the leaflets have a broad silver stripe along the costa on the upper surface, but Schindler's long and detailed description suggests no other characters for separating it from *D. intortum*. The species has been reported from Guatemala as *D. uncinatum* (Jacq.) DC., a plant of South America.

Desmodium Johnstonii Standl. ex J. R. Johnston, Cat. Pl. Guat. 17. 1938, nomen; ex Schubert, Contr. Gray Herb. 135: 95. pl. 2, f. 28-37. 1941.

Moist or dry, brushy or wooded slopes, sometimes in rocky places, 1,500-1,650 meters; endemic; Santa Rosa; Sacatepéquez (type collected in vicinity of Antigua, Standley 58603).

Plants herbaceous, perennial, erect or procumbent, the stems sometimes 1.5 meters long, simple or branched, subterete, densely uncinat-pilose or hispidulous; leaves 3-foliate, the petioles 2.5-3.5 cm. long; stipules broadly ovate-lanceolate, striate, pilose on the outer surface, 10-12 mm. long; leaflets mostly linear-lanceolate, subacute and mucronulate, obtuse at the base, 5-7.5 cm. long, 10-12 mm. wide or sometimes somewhat wider, densely and softly appressed-pilose on both surfaces; inflorescence racemose-paniculate, the branches uncinat-pilose and puberulent, the bracts ovate, long-attenuate, long-ciliate, 5 mm. long, deciduous, the pedicels 5-8 mm. long; calyx pilosulous, 4-6 mm. long; corolla rose-purple, the standard 8-9 mm. long; joints of the loment 4-6, subelliptic or orbicular, separated by a narrow isthmus, uncinat-pubescent and puberulent, 3.5-4.5 mm. long, 3 mm. wide.

This species is common in the planted *Cupressus* grove above the Hotel Manchén at Antigua.

Desmodium macrodesmum (Blake) Standl. & Steyerl., comb. nov. *Meibomia macrodesma* Blake, Contr. U. S. Nat. Herb. 24: 6. 1922.

Known only from the type, collected in Honduras, edge of woods, along trail from Hacienda El Limón to El Paraíso, Dept. Copán, S. F. Blake 7359; the locality is near the border, and the species is to be expected in near-by Guatemala.

Plants herbaceous, scandent, the stems sparsely or densely hispid with brownish uncinat hairs; leaves 3-foliate, on petioles 2.5-5.5 cm. long; stipules deciduous; leaflets ovate or obliquely ovate, 4-11 cm. long, obtuse or acute, broadly rounded at the base, deep green above, appressed-pilose with brown hairs, paler beneath, densely soft-pilose; racemes axillary, 12 cm. long, lax, few-flowered, pubescent like the stem; bracts deciduous; pedicels in fruit 5-12 mm. long; calyx puberulent and hispidulous, 4 mm. long, the teeth acuminate; loment borne on a stipe 5 mm. long; joints of the loment 1-2, rather sparsely rufescent-pilose with straight hairs, reniform-suborbicular, 3 cm. long, 2.5 cm. wide, reticulate, with a deep sinus on the upper margin.

Desmodium Maxonii Standl. Field Mus. Bot. 11: 161. 1936. *Meibomia Maxonii* Standl. Contr. U. S. Nat. Herb. 18: 108. 1916. *M. costaricensis* Schindl. Repert. Sp. Nov. 20: 140. 1924. *D. costaricensis* Standl. Field Mus. Bot. 18: 534. 1937.

Open oak forest, 2,400-2,700 meters; Chimaltenango (Chichavac, A. F. Skutch 696). Costa Rica; Panama.

A branched erect shrub or the stems chiefly herbaceous, terete, finely uncinat-puberulent and long-pilose with white hairs when young; leaves petiolate, 3-foliate, the petiole 1-3.5 cm. long; leaflets broadly lanceolate to ovate, 3-6.5 cm. long, acute to subobtuse, rounded or obtuse at the base, puberulent or short-pilose above, paler beneath, pilose with spreading or subappressed hairs, the nerves impressed on the upper surface; stipules obliquely ovate, long-persistent, usually

reflexed, long-acuminate, 5-8 mm. long; inflorescence composed of numerous, rather short racemes, the rachis uncinat-pubescent, pilose at first, the bracts ovate, abruptly long-attenuate, 7-10 mm. long, the pedicels 2-11 mm. long; calyx puberulent, 3-5 mm. long; corolla rose-purple, longer than the calyx, the standard 10-13 mm. long; loment borne on a stipe 2.5-4 mm. long, 5-6-articulate, the joints rhomboidal, reticulate, 3.5-4.5 mm. long, 2.5-3.5 mm. wide, uncinat-puberulent to almost glabrous, with somewhat revolute margins.

Desmodium metallicum (Rose & Standl.) Standl. Field Mus. Bot. 11: 161. 1936. *Meibomia metallica* Rose & Standl. Contr. U. S. Nat. Herb. 16: 214. pl. 51c. 1913. *Nephromeria metallica* Schindl. Repert. Sp. Nov. 20: 283. 1924. *Galactia nitida* Standl. Carnegie Inst. Wash. Publ. 461: 62. 1935 (type collected at Camp 32 on the boundary between Petén and British Honduras, W. A. Schipp S860).

Moist or wet, mixed forest or thickets, often or perhaps usually on limestone, 1,100 meters or lower; Petén; Alta Verapaz (type from Cajabón, O. F. Cook & R. F. Griggs 354); Izabal; Huehuetenango. Chiapas; British Honduras.

A small or large, woody vine, sometimes 10 meters long, the stems terete, densely uncinat-hirtellous with yellowish hairs; stipules caducous; leaves 3-foliate, on stout petioles 2.5-6 cm. long; leaflets ovate or ovate-lanceolate, 7-13 cm. long, subcoriaceous, acute to usually long-acuminate or attenuate, rounded at the base, glabrous and usually lustrous above, the veins sometimes impressed, densely sericeous beneath with usually bright yellowish hairs, the nerves and veins much elevated and conspicuously reticulate; inflorescence a terminal, sparsely branched panicle or of axillary racemes, the branches densely uncinat-hirtellous, the slender pedicels about 6 mm. long; bracts soon deciduous, lanceolate to ovate, striate, acuminate; calyx finely puberulent, 4 mm. long, the teeth ovate, abruptly acuminate; corolla rose-purple; loment borne on a slender stipe 3 mm. long; joints usually 2, or the lower one sometimes abortive, quadrate-orbicular, 2 cm. long, thin, conspicuously reticulate, almost straight on the upper margin but with an open sinus 2.5 mm. deep.

This species has been reported from both British Honduras and Petén as *D. intortum* (Mill.) Urban, a species unknown at present from those areas, although it may well occur in both of them.

Desmodium molliculum (HBK.) DC. Prodr. 2: 331. 1825. *Hedysarum molliculum* HBK. Nov. Gen. & Sp. 6: 519. 1824. *Copal de coche* (Jalapa).

Open banks or hillsides, most often in pine-oak forest, 1,350-2,000 meters; Zacapa; Jalapa; Huehuetenango. Mexico; north-western and western South America.

Plants herbaceous, prostrate or procumbent, sometimes creeping, the stems densely pilose with soft spreading white hairs, mostly 60 cm. long or less, simple

or branched; leaflets 3, orbicular or nearly so, 1.5–3.5 cm. long, rounded or retuse at the apex, rounded at the base, paler beneath, rather densely pilose on both surfaces with appressed or somewhat spreading hairs, the nerves and veins prominent and reticulate beneath; stipules 4–5 mm. long, persistent or deciduous; inflorescences racemose, terminal, short or usually elongate, lax, few-many-flowered, uncinat-pubescent; bracts as much as 6 mm. long, caducous; pedicels pilose and viscid, 6–15 mm. long; calyx pilosulous, 3 mm. long; corolla purple, almost 1 cm. long; loment stipitate, with 6 or fewer joints, these suborbicular, separated by a narrow isthmus, reticulate, uncinat-puberulent, about 4 mm. long and wide.

Desmodium neomexicanum Gray, Pl. Wright. 1: 53. 1852.

Moist or dry, pine-oak forest, at 1,350 meters; Jalapa (near Jalapa, *Standley* 76726). Southwestern United States; Mexico; western South America.

A very slender annual, much branched from the base, erect to procumbent, the stems sparsely or densely uncinat-puberulent; leaves mostly 3-foliolate, the lowest often 1-foliolate, the petioles very slender, variable in length; leaflets linear-lanceolate to ovate or rhombic, mostly 1.5–5 cm. long, obtuse and mucronate at the apex, cuneate to rounded at the base, almost glabrous to strigose above, paler and sparsely or densely strigose beneath, sometimes uncinulate-puberulent on the nerves; stipules 1.5–6 mm. long; inflorescence racemose-paniculate, the branches uncinat-puberulent, the bracts persistent, reflexed in age; pedicels capillary, in fruit 1–2 cm. long; calyx uncinat-puberulent and pilosulous, 1.5 mm. long; petals 2.5 mm. long or less; loment sessile or nearly so, the joints 4–5, deeply crenate-lobate along both margins.

Desmodium nicaraguense Oerst. Vid. Medd. Kjoebenhavn 1853: 16. 1853. *Meibomia nicaraguensis* Kuntze, Rev. Gen. 198. 1891. *M. nicaraguensis* var. *coriacea* Schindl. Repert. Sp. Nov. 22: 279. 1926 (type from "Lapante," cited as in Guatemala but really Nicaraguan). *Engorda-cabras*; *Barajillo*; *Bledo* (Quezaltenango).

Wet to dry thickets or open rocky hillsides, often in pine or oak forest, 400–2,400 meters; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Quezaltenango; San Marcos. Western Mexico; Salvador to Nicaragua (type from Volcán El Viejo).

An erect shrub of 1–3 meters, woody throughout or nearly so, the branches subterete, very densely uncinat-pilosulous with short white hairs, almost tomentose; stipules about 3 mm. long, caducous; leaves petiolate, 3-foliolate; leaflets usually rather thick, oblong-elliptic to elliptic, mostly 5–7 cm. long, obtuse or usually rounded at the apex, obtuse at the base, very densely pilose on both surfaces, especially beneath, with soft subappressed whitish hairs; inflorescence racemose-paniculate, often very large and much branched, the branches densely uncinat-pubescent, the flowers rose-purple, short-pedicellate; bracts small, lanceolate, caducous; calyx densely sericeous, small, the teeth short, obtuse;

standard about 5 mm. long; loment 6–8-articulate, borne on a short stipe, minutely sericeous, deeply crenate-lobate on both margins, the joints oval-orbicular, about 4 mm. long and 3 mm. broad, almost symmetric.

Known in Salvador by the names "engorda-caballo," "vara de arco," "pie de paloma," "vara larga," "vara blanca," "Juana de Arco," "gutao," and "Juana Larga." The plant has been reported from Salvador and perhaps elsewhere in Central America as *Meibomia Rensonii* Painter, a name which fortunately has not been formally published. This shrub is abundant in many regions along the Pacific slope of Guatemala and Salvador, often forming dense thickets in pastures. The leaves and young branches are eaten by stock of all kinds and are said to afford excellent forage.

Desmodium obtusum (Muhl.) DC. Prodr. 2: 329. 1825. *Hedysarum obtusum* Muhl. ex Willd. Sp. Pl. 3: 1190. 1803. *H. ciliare* Muhl. ex Willd. op. cit. 1196. *D. ciliare* DC. Prodr. 2: 329. 1825.

Sandy pine uplands, little above sea level; British Honduras (Mountain Pine Ridge, El Cayo District, C. L. Lundell 6726). Eastern and southern United States; Cuba.

An erect perennial, sometimes almost a meter high but usually lower, the stems subterete, herbaceous, simple or sparsely branched, uncinat-pubescent; stipules subulate, deciduous; leaves small, usually numerous, the petiole usually short; leaflets 3, broadly ovate or oval, 1–2.5 cm. long, obtuse or rounded at the apex, thick, short-hirsute or pilose on both surfaces with spreading or subappressed hairs; racemes terminal, simple or branched, uncinat-pubescent, the branches usually long, slender, and laxly flowered, the flowers purple, slender-pedicellate; calyx teeth short, ovate, acute; loment sessile or nearly so, the joints 2, with a broad isthmus, oblique-oval, 5 mm. long, 3 mm. wide, densely uncinat-pubescent.

Desmodium orbiculare Schlecht. var. *Salvinii* (Hemsl.) Schubert. *Desmodium Salvinii* Hemsl. Biol. Cent. Amer. Bot. 1: 287. 1880; Diag. Pl. Nov. 3: 46. 1880 (type from Volcán de Fuego, Sacatepéquez, *Salvin*). *Meibomia Salvinii* Kuntze, Rev. Gen. 198. 1891. *M. orbicularis* var. *Salvinii* Schindl. Repert. Sp. Nov. 22: 280. 1926. *Escobilla*; *Escoba amarga*.

Moist or dry thickets, open, often rocky hillsides, or perhaps most often in pine or oak forest, sometimes on limestone, 1,400–2,100 meters; Baja Verapaz; Zacapa; Jalapa; Guatemala; Sacatepéquez; Chimaltenango; Sololá; Quiché; Huehuetenango. Central and southern Mexico.

A slender erect shrub 1–3 meters high, woody almost throughout, often densely branched, the branches brown or dark red, subterete, thinly uncinat-puberulent or glabrate; stipules small, dry, brown or purplish, narrowly ovate, acute or

acuminate, usually persistent; leaves small, slender-petiolate, the leaflets 3, rather thin, broadly oval or elliptic to orbicular, mostly 1.5–4 cm. long, rounded at the apex or rarely subacute, rounded at the base, deep green above, sparsely appressed-pilose or glabrate, somewhat paler beneath, often rather densely appressed-pilose or in age often almost glabrous; inflorescence terminal, large or small, racemose-paniculate, often dense, the racemes rather densely many-flowered, the branches finely puberulent, the flowers rose-purple, slender-pedicellate; calyx 3 mm. long, puberulent and short-pilose, the lowest tooth lanceolate, longer than the others, the shorter ones broadly ovate; corolla about 4 mm. long; loment stipitate, the stipe much longer than the calyx, deeply lobate on both margins, the joints about 4, asymmetric, flat, 5–8 mm. long, 4–5 mm. wide, minutely puberulent or almost wholly glabrous, finely reticulate, separated by a narrow isthmus.

We have seen no authentic material of *Meibomia Micheliana* Schindl., which was reported from Chuacús near Salamá, Baja Verapaz (*Seler* 2409), but from description it does not appear different from *D. orbiculare*. The shrub, a rather handsome one when in early flower, is usually tall and straggling. It has been introduced recently into cultivation in southern California, from Guatemala.

Desmodium Palmeri Hemsl. *Diag. Pl.* Nov. 3: 45. 1880.

Open grassy banks or in mixed or pine forest, 900–2,300 meters; Alta Verapaz; Zacapa; Sololá (Volcán de Santa Clara); Quezaltenango (Volcan de Santa María); Huehuetenango (Sierra de los Cuchumatanes). San Luis Potosí, Mexico.

Plants perennial, herbaceous or suffrutescent below, erect or ascending, 75 cm. high or less, the stems slender, often reddish or purplish, terete, sparsely puberulent or in age glabrous or nearly so, rather densely leafy below; leaves on short slender petioles, 3-foliolate, the leaflets mostly lance-oblong and 2–4 cm. long, obtuse or subobtuse and apiculate at the apex, rounded or obtuse at the base, thick and firm, often glaucescent beneath, sparsely setulose beneath or glabrous; flowers rose-purple or sometimes white, in long slender lax racemes, the racemes simple, terminal, mostly few-flowered, the pedicels long and slender, geminate or solitary; bracts early deciduous, striate, ovate, abruptly narrowed into a long subulate tip; calyx sparsely pilose; fruit uncinat-puberulent, constricted on both margins but much more deeply so on the lower margin, the joints very asymmetric, about 5 mm. long and 4 mm. wide.

Desmodium plicatum Schlecht. & Cham. *Linnaea* 5: 585. 1830. *D. hondurensis* Donn. Smith, *Bot. Gaz.* 20: 285. 1895 (type from San Pedro Sula, Honduras).

Open oak forest, about 1,700 meters; Huehuetenango (near San Rafael Péztal). Western and southern Mexico; mountains of Honduras.

A slender shrub of 1–2 meters, woody throughout or nearly so, sparsely branched, terete, very densely white-pilose with short spreading white hairs, the hairs simple or some of them uncinat; stipules linear, tomentose, small and incon-

spicuous; leaves on short petioles 1.5 cm. long or often much shorter; leaflets 3, rather thick, mostly oblong, sometimes narrowly oblong or oblong-ovate, 2-7 cm. long, rounded at the apex, rounded or obtuse at the base, very densely pilose on both surfaces, the hairs soft, not appressed, white on the lower leaf surface, the veins often impressed on the upper surface; inflorescences terminal, racemose-paniculate, often large and much branched, the branches densely white-pilose; bracts small, linear, caducous; flowers rose-purple or violet, on very short pedicels, usually densely crowded; calyx 2 mm. long, almost bilabiate, densely whitish-pilulous; standard 5 mm. long; loment short-stipitate, densely white-tomentose, the joints about 4, closely folded together, rounded-elliptic, about 4 mm. long and 3 mm. wide.

Called "mozotón" in Honduras.

Desmodium prehensile Schlecht. Linnaea 12: 315. 1838.

Damp thickets and in damp oak forest, 1,360-1,650 meters; Jalapa (vicinity of Jalapa and mountains about Chahuite). Mexico.

Plants herbaceous, perennial, procumbent to subscandent, the stems 1-1.2 meters long, simple or branched, subterete, densely fulvous-uncinate-pilose; leaves 3-foliate, the petioles 1.5-4 cm. long, densely fulvous-uncinate-pilose; stipules ovate-lanceolate, striate, pilose on the outer surface, especially near the margins, 4-5 mm. long; leaflets elliptic- to linear-oblong, rounded to obtuse and mucronulate, obtuse to rounded at the base, 2.5-7 cm. long, 8-20 mm. wide, appressed-strigose-pilose and green above, densely puberulent and gray-green beneath; inflorescence racemose-paniculate, the branches densely uncinat-pilose with fulvous hairs, the bracts linear-lanceolate, small, 2-3 mm. long, deciduous, the pedicels capillary, 5-8 mm. long, uncinulate-puberulent; calyx sparsely pilose, especially the lobes, 2.5-3 mm. long; corolla rose-purple, the standard 6-8 mm. long; joints of the loment 6-8, rhomboidal, densely uncinat-puberulent, 2.5-3.5 mm. long, 1.8-2.5 mm. wide, deeply crenate-lobate on one margin.

Desmodium procumbens (Mill.) Hitchcock, Rept. Mo. Bot. Gard. 4: 76. 1893. *Hedysarum procumbens* Mill. Gard. Dict. ed. 8. no. 10. 1768. *H. spirale* Swartz, Prodr. Veg. Ind. Occ. 107. 1788. *D. spirale* DC. Prodr. 2: 332. 1825. *Meibomia procumbens* Schindl. Rept. Sp. Nov. 20: 151. 1924. *M. spiralis* Kuntze, Rev. Gen. 197. 1891.

The species has been treated in detail by Miss Schubert (Contr. Gray Herb. 129: 3. 1940), who recognizes four varieties, all of which are represented in Guatemala. They may be distinguished by the following key. The synonymy cited above pertains to var. *typicum*.

Leaves with leaflets essentially uniform in shape throughout the plant; leaflets all longer than broad.

Pedicels short, straight, relatively stout; bracts deciduous; rachis of the inflorescence chiefly uncinat-hispidulous. var. *typicum*.

Pedicels filiform, very long and flexuous; bracts persistent; rachis of the inflorescence glabrous to pilose. var. *longipes*.

Leaves with leaflets of various shapes in different parts of the plant, the leaflets of the lowest leaves broader than long.

Leaflets all transverse-elliptic or some of them rhombic. . . . var. *transversum*.

Leaflets of the upper leaves linear or linear-lanceolate. var. *exiguum*.

Desmodium procumbens var. **typicum** Schubert, Contr. Gray Herb. 129: 5. 1940.

Moist thickets or thin forest, often on rocky slopes, sometimes on sandbars along streams, 200–1,800 meters; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Chimaltenango; Quezaltenango. Mexico; Salvador to Costa Rica and Panama; West Indies; South America; tropical Africa and Philippines (probably introduced).

Plants annual, very slender, mostly 50 cm. high or less, commonly much branched, erect or procumbent, the stems sparsely or densely uncinat-hispidulous; leaves slender-petiolate, 3-foliate; stipules broad at the base, very narrow above, 1–4.5 mm. long; leaflets small, thin.

The Maya name of Yucatan is reported as “kintah.”

Desmodium procumbens var. **exiguum** (Gray) Schubert, Contr. Gray Herb. 129: 12. 1940. *D. exiguum* Gray, Pl. Wright. 2: 46. 1853.

Moist or rather dry thickets, often on brushy rocky slopes, sometimes on sandbars, 200–700 meters; Zacapa; Chiquimula. Southwestern United States; Mexico; Colombia.

Leaflets of the basal leaves chiefly transversely rhombic or elliptic, 1–2.5 cm. long, 1–2.5 cm. wide; leaflets of the upper leaves linear or linear-lanceolate, 1–5 cm. long.

Plants of this species and its various varieties are rather ephemeral. They are found commonly during the wet months in the regions where they grow, but they wither quickly when the rains cease.

Desmodium procumbens var. **longipes** (Schindl.) Schubert, Contr. Gray Herb. 129: 8. 1940. *Hedysarum tenellum* HBK. Nov. Gen. & Sp. 6: 522. 1824, not D. Don, 1825. *Meibomia tenella* var. *longipes* Schindl. Repert. Sp. Nov. 20: 151. 1924 (type from Retalhuleu, Bernoulli & Cario 1206).

Moist to wet thickets or in rather dry, often rocky places, 150–1,800 meters; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Chimaltenango; Retalhuleu. Southern Mexico; Salvador to Panama; northwestern South America.

A slender annual, erect or ascending, 75 cm. high or less, often much branched; leaflets 3, thin, broadly ovate to elliptic, the terminal ones mostly 2-6 cm. long, obtuse or acute.

Desmodium procumbens var. **transversum** (Rob. & Greenm.) Schubert, Contr. Gray Herb. 129: 11. 1940. *D. spirale* var. *transversum* Rob. & Greenm. Proc. Amer. Acad. 29: 384. 1894.

Moist or rather dry, grassy or brushy slopes, often in rocky places, 400-900 meters; Zacapa; Chiquimula. Central and southern Mexico; Costa Rica; Venezuela.

Plants very slender, much branched, often procumbent; leaves more or less uniform throughout the plant, 1-foliate or partly 3-foliate; leaflets varying from rhombic or broadly cuneate to elliptic or oblong, many of them broader than long, mostly 1-2.5 cm. long and broad.

Desmodium psilophyllum Schlecht. Linnaea 12: 310. 1838.

Moist or rather dry thickets or open pine-oak forest, 1,700-2,100 meters; Huehuetenango. Mexico.

Plants perennial, erect, strict, slender, usually 35-75 cm. high, the stems terete, simple or rather freely branched, glabrous or sparsely and minutely uncinately puberulent; leaves 1-foliate, on slender petioles less than 1 cm. long, narrowly lance-oblong to almost linear-lanceolate, 2.5-7 cm. long, 1-1.5 cm. wide, narrowed to an obtuse apex, broadly rounded or subtruncate at the base, glabrous or nearly so, somewhat paler beneath, the nerves elevated, the blades rather thick and firm; stipules subulate or lanceolate, striate, persistent; inflorescence racemose-paniculate, narrow and sparsely branched, uncinately puberulent or glabrate; flowers lavender, on long slender pedicels; calyx minutely puberulent, scarcely more than 1.2 mm. long, the teeth very broad, obtuse or subacute; petals about 4 mm. long; loment 4-5-articulate, borne on a stipe longer than the calyx, the joints conspicuously asymmetric, about 4 mm. long and 2.5 mm. wide, separated by a narrow isthmus, uncinately puberulent, reticulate-veined.

Desmodium retinens Schlecht. Linnaea 12: 311. 1838.

In pine-oak forest, at 1,900 meters; Huehuetenango (Aguacatán road, 10 km. east of Huehuetenango, Standley 82150). Mexico.

Plants herbaceous, procumbent to erect, the stems sparsely uncinately hirtellous, 90 cm. long, elongated, simple or slightly branched above; leaflets 3, ovate-elliptic to oblong, 1-2 cm. long, obtuse and mucronate at the apex, cuneate to rounded at the base, subglabrate to sparsely pilosulous above, pilosulous beneath, prominently reticulate-veined; stipules 3-4 mm. long, becoming dark brown in age, subulate-acuminate from an ovate base; inflorescence racemose-paniculate, the branches uncinately puberulent, the bracts persistent, spreading; pedicels capillary, in fruit 1-1.5 cm. long; calyx uncinately puberulent, 1.5-2 mm. long; petals 3 mm. long; loment short-stipitate, the joints 3-4, deeply crenate-lobate along both margins, subrotund.

The single Guatemalan specimen is doubtfully referred to this species.

Desmodium scorpiurus (Swartz) Desv. Journ. de Bot. 1: 122. 1813. *Hedysarum scorpiurus* Swartz, Prodr. Veg. Ind. Occ. 107. 1788. *Meibomia scorpiurus* Kuntze, Rev. Gen. 198. 1891. *Mozote*; *Pegapega*.

Grassy fields or hillsides, or moist or dry thickets, sometimes in pine forest, a common weed along roadsides or about dwellings, occasionally on sandbars along streams, 1,500 meters or less, most plentiful at low elevations; Alta Verapaz; Izabal; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Suchitepéquez; Retalhuleu; San Marcos. Mexico; British Honduras to Salvador and Panama; West Indies; South America; naturalized in some parts of the Old World tropics.

Plants perennial, often from a thick woody root, branched from the base, the stems prostrate and often forming mats, slender, pilose and puberulent, usually very leafy; stipules obliquely ovate, semicordate, about 4 mm. long; leaflets 3, oblong to elliptic or ovate-elliptic, 1-4 cm. long, obtuse or rounded at the apex, appressed-pilose on both surfaces; racemes very slender, mostly 10 cm. long or shorter, lax, the slender pedicels 1 cm. long or less; bracts lance-subulate, 2 mm. long, deciduous; calyx 2.5 mm. long, the teeth linear-lanceolate; corolla 3 mm. long, purple or pink, or frequently white or whitish; loment linear, almost sessile, 2-8-articulate, about equally crenate-undulate on both margins, the joints narrowly oblong, 2-3 times as long as broad, not at all twisted, somewhat striate longitudinally, covered with short uncinat hairs.

Sometimes known in Salvador by the names "trencilla" and "hierba de Santa Teresa." This is one of the most abundant weedy plants of the lowlands of all Central America, especially about door-yards. The pods often adhere in quantity to the feathers and feet of birds. The specific name signifies "scorpion tail," in allusion to the form of the fruit.

Desmodium Seleri (Schindl.) Standl. & Steyerl., comb. nov. *Meibomia Seleri* Schindl. Repert. Sp. Nov. 20: 141. 1924.

Known only from the type, Huehuetenango, between Guaxacaná and Quen Santa, C. & E. *Seler* 2803.

Plants perennial, suffrutescent, the stems several, erect, about 60 cm. high, uncinat-hispidulous; stipules ovate, long-caudate, brown, striate, densely pilose, as much as 18 mm. long and 6 mm. wide; leaves petiolate, 3-foliate, the petiole 10 cm. long or shorter; leaflets thin, the terminal one cordate-orbicular, about 7 cm. long and wide, obtuse or retuse, uncinat-pubescent above on the nerves, appressed-pilose on both surfaces, the lateral leaflets broadly elliptic, somewhat smaller

than the terminal one; racemes terminal, as much as 30 cm. long, lax, uncinat-pilose; bracts ovate, acuminate, striate, laxly pilose, 4 mm. long or less, caducous; pedicels geminate, at anthesis 12 mm. long or shorter; calyx 8 mm. long, pilose, the teeth narrowly triangular, acute; corolla 10 mm. long, yellowish green; ovary about 6-ovulate.

We have seen no material of this species.

Desmodium Skinneri Benth. ex Hemsl. *Diag. Pl. Mex.* 3: 47. 1880. *Meibomia Skinneri* Kuntze, *Rev. Gen.* 198. 1891. *Pasto de chivo*; *Mozote globillo* (fide Aguilar).

Moist or dry thickets or open pine-oak forest, often on rocky hillsides, 1,000–1,800 meters; type collected in Guatemala by Skinner, the exact locality unknown; Guatemala; Sacatepéquez; Chimaltenango; San Marcos; Huehuetenango. Central and southern Mexico.

A slender erect shrub 1.5–2.5 meters high, sparsely branched or almost simple, the young branches densely strigose with yellowish brown hairs, glabrate in age; leaves 3-foliolate, the petioles 5 cm. long or less; stipules lanceolate, 7–8 mm. long, deciduous; leaflets rather thick and firm, ovate to oblong or rhombic-lanceolate, 12 cm. long or less, subacute or obtuse, rounded or obtuse at the base, sparsely strigillose above, paler or yellowish beneath and densely velutinous-pilose; inflorescence a usually dense, much branched, leafy or almost naked panicle, the branchlets usually uncinat-pilose; flowers deep purple, on filiform pedicels 3 mm. long; bracts subulate, very short, deciduous; calyx appressed-pilosulous, the teeth ovate, acute; corolla 6–7 mm. long; loment usually 3-articulate, borne on a slender stipe 2–3 mm. long, deeply constricted between the joints; joints semiorbicular, 11–13 mm. long, 7 mm. wide, with very thin, membranaceous valves, with a very shallow sinus on the upper edge, puberulent when young, in age glabrous or nearly so.

This plant is noteworthy in the genus for its very dark purple flowers.

Desmodium strobilaceum Schlecht. *Linnaea* 12: 316. 1838. *Bay* (Huehuetenango).

Usually in open, rather dry, pine-oak forest, 600–2,000 meters; Zacapa; Santa Rosa; Sacatepéquez; Chimaltenango; Sololá; Huehuetenango. Central and southern Mexico; Salvador.

Plants perennial, erect or decumbent, usually 75 cm. high or lower, the stems simple or sparsely branched, stout, subterete, very densely pilose with straight, spreading or reflexed, whitish hairs; stipules triangular, acuminate, caducous; leaves on rather stout and long petioles, 3-foliolate; leaflets elliptic-oblong to oval or elliptic, mostly 5–8.5 cm. long, obtuse or rounded at the apex, rather thick, very densely and softly pilose on both surfaces with spreading or subappressed hairs, usually paler beneath; racemes long and strict, mostly simple, sometimes sparsely branched, dense, more or less comose-bracteate at first, the bracts ovate-lanceolate,

long-acuminate, deciduous; flowers rose-purple, short-pedicellate, the pedicels and rachis uncinat-pubescent; calyx about 3 mm. long, the corolla 6 mm. long; loment 4-6-articulate, sessile or short-stipitate, deeply crenate-lobate along both margins, the joints about 4 mm. long and 3 mm. broad, very densely uncinat-pubescent.

Desmodium tenuipes (Blake) Schubert. Contr. Gray Herb. 129: 26. 1940. *Meibomia tenuipes* Blake, Bot. Gaz. 78: 285. pl. 4, f. 8. 1924. *D. tenuipes* var. *glabrescens* Schubert, loc. cit. (type collected near Santa María de Jesús, Sacatepéquez, F. W. Hunnewell 14699). *Pegapega*.

Moist thickets or open oak forest, sometimes pendent from banks, 1,500-2,400 meters; endemic; Zacapa; Jalapa; Guatemala; Sacatepéquez; Chimaltenango; Sololá; Quezaltenango; San Marcos; Huehuetenango (type collected between Jacaltenango and San Martín, E. W. Nelson 3604).

Plants usually erect and 1-1.5 meters high, herbaceous or suffrutescent, the stems slender, often abundantly branched, densely pilose with spreading, whitish, straight or uncinat hairs, sometimes glabrate; stipules triangular-ovate, persistent, reflexed, 5 mm. long; leaves long-petiolate, 3-foliate; leaflets ovate, mostly 4-5 cm. long, narrowed to an obtuse apex, rounded at the base, rather thin, appressed-pilose on both surfaces; racemes very lax, paniculate, the bracts lance-subulate or lance-ovate, 4 mm. long, the branches pilose and uncinat-pubescent, the pedicels very slender, mostly 8-15 mm. long; calyx puberulent, 4-5 mm. long; corolla purple, the standard 9 mm. long; loment long-stipitate, somewhat twisted, finely puberulent, uncinat-hispidulous on the margins, deeply crenate-lobate on both margins; joints 3-5, oval, 4 mm. long, 3-4 mm. wide.

Var. *glabrescens* differs only in having glabrate stems and less abundant pubescence than the typical variety (var. *typicum* Schubert) of the species.

Desmodium tortuosum (Swartz) DC. Prodr. 2: 332. 1825. *Hedysarum tortuosum* Swartz, Prodr. Veg. Ind. Occ. 107. 1788. *H. purpureum* Mill. Gard. Dict. ed. 8. no. 6. 1768. *Meibomia tortuosa* Kuntze, Rev. Gen. 198. 1891. *M. purpurea* Vail ex Small, Fl. Southeast. U. S. 639. 1903. *D. purpureum* Fawc. & Rendle, Fl. Jam. 4: 36. 1920, not Hook. & Arn. 1832. *Mozotón* (fide Aguilar).

Moist or dry thickets, often in rocky places, frequently along rocky or sandy stream beds, 1,200 meters or lower; Baja Verapaz; El Progreso; Izabal; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez. Florida; southern Mexico; British Honduras to Panama; West Indies; South America.

Plants usually perennial, herbaceous throughout or nearly so, erect, 1.5 meters high or less, the stems stout, often much branched, subterete, uncinat-pubescent;

stipules deciduous or persistent, 1 cm. long or shorter; leaves long-petiolate, 3-foliate; leaflets elliptic to rhombic-ovate, mostly 4–5 cm. long, sometimes larger, obtuse, mucronate, conspicuously reticulate-veined, puberulent or softly appressed-pilose on both surfaces; inflorescence racemose-paniculate, often large and much branched, the branches glandular-pilose; bracts about 5 mm. long, soon deciduous, the slender pedicels 10–17 mm. long; calyx puberulent and hirsute, about 2.5 mm. long; corolla purple, the standard 4 mm. long; loment sessile, 4–6-articulate, more or less twisted, the joints rhomboidal or the terminal one suborbicular, about 3.5 mm. long and 3 mm. wide, densely uncinat-puberulent.

Called "mozote" in Honduras; "kintah" (Yucatan, Maya).

Desmodium triflorum (L.) DC. Prodr. 2: 334. 1825. *Hedysarum triflorum* L. Sp. Pl. 749. 1753. *Meibomia triflora* Kuntze, Rev. Gen. 197. 1891. *Frijolillo*, *Alfalfilla de llano* (fide Aguilar); *Platt* (Izabal, fide Blake).

Moist or dry fields or banks, sometimes in thickets, frequently in grassy places or on sandbars along streams, 1,800 meters or less, mostly at low elevations; Izabal; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Retalhuleu; San Marcos; Huehuetenango. Florida; Mexico; British Honduras to Salvador and Panama; West Indies; South America; Old World tropics (introduced?).

Plants perennial, herbaceous, very slender, prostrate and rooting, often forming dense mats or large colonies, the branches pilose or glabrate, 30 cm. long or less; stipules lanceolate or ovate-lanceolate, 2.5 mm. long, acuminate; leaves on slender petioles 4–10 mm. long, the 3 leaflets broadly obovate or rounded, 6–11 mm. long, emarginate or subtruncate at the apex, glabrous or nearly so; flowers 1–3 together, in axillary clusters or opposite the leaves, the slender pedicels shorter than the leaves; calyx 4–5 mm. long, deeply dentate; corolla usually bright purple, little longer than the calyx; loment curved, 2 cm. long or less, 4–6-articulate, the upper margin continuous, the lower one deeply crenate; joints reticulate, pilose or glabrate.

Called "hierba cuartillo" and "estacal" in Salvador. In habit the plant reminds one of a diminutive clover (*Trifolium*). It is often an abundant weed in lawns and pastures.

Desmodium Wydlerianum Urban, Symb. Antill. 2: 302. 1900.

Wet mixed forest, at or little above sea level; Petén (Río San Román west of Chinajá, *Steyermark* 45536); Izabal (Montaña del Mico). Costa Rica; West Indies; northwestern South America.

Plants perennial, herbaceous or suffrutescent below, prostrate or ascending, the stems rooting at the nodes, slender, uncinat-puberulent; leaves 3-foliate, on slender petioles 4–5 cm. long; stipules caducous, 5 mm. long; leaflets ovate, thin, 4.5–9 cm. long, acuminate, pale beneath and strigose, thinly strigose above and

deep green, truncate or broadly rounded at the base; inflorescence axillary, racemose, the rachis striate, the bracts 1.5 mm. long, caducous, the slender pedicels uncinately puberulent, 2 cm. long or shorter; calyx 3.5 mm. long; corolla pale purple, the standard 4.5 mm. long; loment stipitate, usually 2-articulate, the stipe 2 mm. long; joints straight along the upper edge, rounded on the lower margin, 8–10 mm. long, 4.5 mm. wide, uncinately pubescent.

DIOCLEA HBK.

Woody or suffrutescent vines, often climbing over tall trees; leaves pinnately 3-foliolate, stipellate; flowers usually violaceous, fasciculate-racemose along the thick peduncles, the rachis nodose, the bracts often conspicuous, caducous, the bractlets membranaceous, caducous; upper 2 calyx lobes united into 1 entire one, the lateral lobes smaller, the lowest often longer; standard orbicular or ovate, reflexed, with inflexed auricles at the base; wings obovate or oblong, free, somewhat longer than the keel, this incurved, rostrate or obtuse; vexillar stamen free at the base, connate at the middle with the others, the anthers uniform or the alternate ones abortive; ovary subsessile, 2-many-ovulate, the style incurved, usually not barbellate, thickened or dilated toward the apex, the stigma terminal, truncate; legume linear to oblong or semiorbicular, compressed or turgid, coriaceous, the upper suture dilated or narrowly winged on each side, 2-valvate; seeds compressed or globose, not strophiolate, the hilum short or linear.

Probably 20 species or more, in the tropics of both hemispheres but chiefly American. One other species has been reported in Central America, from Panama.

Leaflets conspicuously 3-nerved from the base, glabrous or nearly so . . . *D. trinervia*.
Leaflets penninerved, often densely pubescent.

Legume about 1.5 cm. wide; calyx glabrous or nearly so *D. virgata*.

Legume 5 cm. wide or larger; calyx pubescent.

Pubescence of the stems and petioles of long spreading stiff hairs; bracts of the inflorescence spreading or ascending *D. megacarpa*.

Pubescence of the stems and petioles of mostly short, appressed or strongly ascending hairs; bracts reflexed *D. reflexa*.

Dioclea megacarpa Rolfe, Kew Bull. 139. 1901. *D. Wilsonii* Standl. Field Mus. Bot. 4: 310. 1929 (type from Punta Triunfo near Tela, Honduras). *Ojo de mono*.

Wet forest or thickets, 300 meters or less; Izabal. British Honduras; Honduras; Salvador; West Indies; northern South America.

A large woody vine, climbing over trees, the branches hirsute; stipules falcate-lanceolate, hirsute, long-produced below the point of attachment; leaves long-petiolate, the petiole and rachis rufous-hirsute; leaflets broadly elliptic or oval, mostly 10–15 cm. long, broadly rounded to abruptly short-acuminate at the apex, broadly rounded at the base, green and lustrous above, hirsute or glabrate, rather densely rufous-hirsute beneath; peduncles much longer than the leaves, often 30–45 cm. long, hirsute with long spreading hairs, much enlarged at the nodes, the

bracts linear, spreading or ascending, much longer than the buds, the pedicels 6 mm. long or shorter; bractlets reniform-orbicular; calyx broadly campanulate, pubescent, the tube 8-10 mm. long; petals purple or violet, almost 2 cm. long; legume about 15-16 cm. long and 5-5.5 cm. wide, ligneous, strongly compressed, velutinous-pilose or glabrate, the valves narrowly winged or costate along the upper suture; seeds 3-4, lustrous, the linear hilum almost half the circumference of the seed.

A common plant of wet forests of the North Coast, very showy when in flower, often plentiful in swamp forests.

***Dioclea reflexa* Hook. f. in Hook. Niger Fl. 306. 1849.**

British Honduras, in wet forest near sea level; Chiapas; Costa Rica; Panama; West Indies; northern South America; tropical Africa and Asia.

A large woody vine, the stems pilose with appressed or ascending hairs, or often glabrate; stipules lanceolate, produced at the base, 2 cm. long; leaves long-petiolate, the leaflets petiolulate, ovate or elliptic, 8-15 cm. long, 5-10 cm. wide, abruptly short-acuminate, rounded at the base, lustrous above and almost glabrous, paler beneath, appressed-pilose, at least on the nerves, often glabrate; inflorescence rufous-tomentose, much longer than the leaves, the rachis stout, much enlarged at the nodes, the bracts lanceolate, reflexed, appressed-pilose, 1.5-2 cm. long; bractlets ovate, about 2 mm. long, persistent; pedicels 3 mm. long; calyx appressed-pilose, the tube 7 mm. long; petals violet, the standard 1.5 cm. long; ovary 3-4-ovulate; legume compressed, 12-20 cm. long, 6-7 cm. wide, rufous-tomentose at first but in age almost glabrous, the upper suture with a broad costa on each side; seeds 2-4, the linear hilum half the circumference of the seed.

Called "horse-eye seed" in British Honduras.

***Dioclea trinervia* Donn. Smith, Bot. Gaz. 56: 53. 1913 (type from Sepacuité, Alta Verapaz, *O.F. Cook & R.F. Griggs* 140). *Monoplegma sphaerospermum* Piper, Journ. Wash. Acad. Sci. 10: 432. 1920. *M. trinervium* Piper, Contr. U. S. Nat. Herb. 22: 664. 1926.**

Moist or wet thickets or forest, 800-1,400 meters; Alta Verapaz. Costa Rica.

A small or large, somewhat woody vine, the stems sparsely strigillose at first, glabrate in age, dark brown; stipules oblong, subacute, not produced at the base; leaves long-petiolate; leaflets thin, ovate or elliptic-ovate, 6-11 cm. long, 4-6 cm. wide, abruptly short-acuminate, rounded at the base, very sparsely strigillose or almost glabrous, conspicuously 3-nerved from the base; peduncles puberulent, much longer than the leaves, nodose; pedicels much shorter than the calyx, hirtellous; calyx 7 mm. long, sparsely puberulent or almost glabrous; bractlets persistent, ovate-rounded; petals violaceous, about 1 cm. long, the standard orbicular, retuse; legume oblong, turgid, subligneous, 5-12 cm. long, 3-4 cm. wide, obliquely short-rostrate at the apex, glabrous or nearly so, the valves slender-costate along the upper suture; seeds 2-5, subglobose, black, sublustrous, 2 cm. long, the hilum linear, more than half the circumference of the seed.

This is the type of the genus *Monoplegma* Piper, which apparently has little basis for segregation from *Dioclea*, if any at all. In publishing the genus, its author compared it with *Canavalia* and *Dolichos*, from which it is, of course, fully distinct, but he did not refer to its relationship with *Dioclea*, the genus under which it was first described by Captain Smith.

Dioclea virgata (L. Rich.) Amshoff, Med. Bot. Mus. Utrecht 52: 69. 1939. *Dolichos virgatus* L. Rich. Act. Soc. Hist. Nat. Paris 1: 111. 1792. *D. lasiocarpa* Mart. ex Benth. Ann. Wien. Mus. 2: 133. 1838.

Moist or wet thickets, 100 meters or less; Izabal. British Honduras; reported from Panama; southward to Brazil and Peru.

A small or rather large vine, suffrutescent, the stems and petioles densely short-pilose; stipules 2 mm. long, not produced at the base; leaves long-petiolate, the leaflets ovate to elliptic or broadly obovate, thin, 5-14 cm. long, 4-7 cm. wide, abruptly acuminate, pilose above on the nerves, elsewhere glabrous or nearly so, sparsely or rather densely appressed-pilose beneath; racemes longer than the leaves, many-flowered, the flowers long-pedicellate, violaceous, as much as 3 cm. long; bractlets thin, suborbicular, membranaceous, glabrous or pubescent, 1 cm. long or shorter, at first enclosing the flowers, soon deciduous; calyx glabrous, the tube 1 cm. long; anthers all fertile; ovary villous, about 10-ovulate; legume coriaceous, 7-12 cm. long, 1.5-2 cm. wide, densely rufous-hirsute, the hairs spreading, easily separable, the upper suture narrowly costate on each side; seeds 5-10, oblong, compressed, 1 cm. long, 6 mm. wide, the hilum half the circumference of the seed.

This has been reported from Guatemala and British Honduras as *D. guianensis* Benth., a species superficially similar, frequent in Costa Rica and Panama.

DIPHYSA Jacquin

Trees or shrubs, unarmed but the branchlets sometimes spinescent; leaves alternate, odd-pinnate, the leaflets often alternate, short-petiolulate; stipules small, caducous; stipels none; flowers racemose, solitary at the nodes of the rachis, the bracts caducous, each flower 2-bracteolate; calyx campanulate, the 5 lobes unequal, the 2 uppermost broad, rounded at the apex, the 2 lateral ones of about the same length but narrower, obtuse or acute, the lowest one narrow, lanceolate or subulate, somewhat longer than the others; petals unequal, short-unguiculate, yellow; blade of the standard reflexed, suborbicular, with 2 small callosities above the base; wings obliquely obovate, the keel petals lunate, subacute to rostrate, free at the apex; stamens diadelphous, the anthers uniform; ovary stipitate, many-ovulate; legume stipitate, oblong, the pericarp separating into 2 layers, the endocarp chartaceous, somewhat interrupted between the seeds, the exocarp papyraceous, reticulate, becoming much inflated and forming a sort of bladder along each side of the legume; seeds transverse-oblong, attached near one end to the slender funicle, the radicle incurved.

Perhaps 15 species, in tropical America and mostly in Mexico and Central America. One other species is known from Guanacaste, Costa Rica.

Leaflets small, mostly 3–9 mm. long; racemes chiefly 1–2-flowered; legume scarcely at all inflated *D. spinosa*.

Leaflets mostly 15–35 mm. long; racemes usually several-flowered; legume conspicuously inflated.

Pedicles and branches of the inflorescence glandular-viscid; calyx lobes and bractlets glandular-denticulate *D. macrophylla*.

Pedicles and branches of the inflorescence glabrous or pubescent, the pubescence not viscid; calyx lobes and bractlets not glandular-denticulate.

Branchlets and peduncles rather densely pubescent, the leaflets also often pubescent, at least when young *D. floribunda*.

Branchlets, peduncles, and leaflets glabrous or practically so.

Leaflets mostly 15–35 mm. long; corolla 18–20 mm. long. . *D. robinoides*.

Leaflets mostly 7–15 mm. long; corolla about 10 mm. long.

D. carthagenensis.

Diphysa carthagenensis Jacq. Enum. Pl. Carib. 28. 1760. *Guachipilin*; *Zuzoc*, *Zuzul* (Petén, Maya).

Low forest or thickets, sometimes on uplands, 300 meters or less; Petén. Yucatan Peninsula of Mexico; British Honduras; Colombia and Venezuela.

A shrub or small tree, usually 12 meters high or less, the branchlets brown or ferruginous, often short and spinescent, glabrous or at first sparsely strigose; leaflets 9–19, oblong, usually 7–15 mm. long, sometimes slightly larger, rounded or retuse at the apex, rounded or obtuse at the base, glabrous; racemes 3–5 cm. long, 1–4-flowered; bractlets oblanceolate, obtuse, 3 mm. long; calyx glabrous, the tube 5 mm. long; corolla bright yellow, 1 cm. long; legume inflated, about 4 cm. long and 1.5 cm. wide, rugose, glabrous, on a stipe 5 mm. long.

Called “wild ruda” in British Honduras, and the Maya name is reported as “susuc” or “tsutsuc”; the Maya name “xbabalche” is recorded from Yucatan.

Diphysa floribunda Peyritsch, Linnaea 30: 78. 1859. *Guachipilin*; *Canquixte*, *Qu'ix-c'an-te* (Chuh, fide Seler); *Palo amarillo* (Huehuetenango).

Brushy, dry or moist, often rocky hillsides, or in thin forest, 1,400–2,100 meters; Escuintla; Guatemala; Sacatepéquez; Sololá; Quezaltenango; Huehuetenango. Southern Mexico.

A large shrub or usually a small or medium-sized tree, rarely more than 10 meters high and usually lower, the branchlets densely puberulent when young; stipules lanceolate, 2–3 mm. long, caducous; leaf rachis densely puberulent; leaflets 7–13, alternate or subopposite, oblong, 1–2 cm. long, rounded at each end,

puberulent or glabrate, pale beneath; racemes 3–5 cm. long, the bracts and bractlets linear, caducous, the pedicels 6–8 mm. long; calyx glabrous, 8–9 mm. long, the lobes very short; corolla 12–15 mm. long; ovary puberulent; legume much inflated, 4–6 cm. long, 15–18 mm. wide, reticulate, on a stipe 1 cm. long; seeds light brown.

This species is closely related to *D. robinoides*, differing in little except pubescence, and it is questionable whether the two are really distinct. Most of the species of *Diphysa* are closely related, and it is very improbable that more than half of the 17 recognized in North America by Rydberg are valid species. This tree is very common at middle elevations in the central regions, abundant in many localities, and conspicuous when in flower because of its great masses of brilliant yellow blossoms. The tree is deciduous, and usually blooms when the young leaves are unfolding. The blooming season generally is a long one. The name "guachipilín," current throughout Central America, is of Nahuatl derivation and signifies "tree *Crotalaria*." A *caserío* of Sacatepéquez has been named El Guachipilín. The crown of the tree is often low and irregular, the trunk low and often crooked or twisted. The wood is easily recognized because of its greenish or greenish yellow color, which becomes dark brown or reddish brown upon exposure; the sapwood is thin and yellowish white; it is hard, heavy, strong, and very durable. The wood is used locally for house- and fence-posts and in manufacture of small agricultural implements. Formerly small amounts of it were exported from tropical America for the yellow dye that it yields. It still is used locally in dyeing, especially as a substitute for fustic (*Chlorophora*). The trees often are propagated as living fence-posts.

***Diphysa macrophylla* Lundell, Lloydia 2: 89. 1939.**

Known only from the type locality, on river bank, Vaca, El Cayo District, British Honduras, *P. H. Gentle* 2317.

A shrub, the branchlets, racemes, and leaf rachis viscid-setulose with yellowish broad-based spreading hairs; leaflets 7–13, oval, 1.5–4.5 cm. long, 1–2.5 cm. wide, rounded at each end, rather thick and firm, glabrous, ciliate at first, paler beneath; racemes 4–11 cm. long, the pedicels 6–10 mm. long; bractlets 5–6 mm. long, glandular-serrulate; calyx 1 cm. long, glabrous, the lobes glandular-ciliate; corolla 12 mm. long; ovary viscid-setulose.

***Diphysa robinoides* Benth. in Benth. & Oerst. Vid. Medd. 11. 1853. *Guachipilín*; *Palo amarillo*; *Much* (Baja Verapaz, fide Tejada).**

Moist or dry forest, often on open brushy hillsides or in rocky places, 600–2,500 meters; Alta Verapaz and Baja Verapaz (probably

this species); Chiquimula (probably referable here); Jutiapa; Sacatepéquez; Retalhuleu; Quezaltenango; San Marcos; Quiché (probably this species); Huehuetenango. Southern Mexico; Salvador to Panama.

Commonly a tree of 5-9 meters, but sometimes 23 meters high with a thick trunk, the branchlets glabrous; leaflets 9-15, oval or obovate, 1.5-3.5 cm. long, rounded or retuse at the apex, glabrous, paler beneath; racemes 4-7 cm. long, few-flowered, glabrous, the pedicels 4-6 mm. long or in fruit 1.5-2 cm.; calyx glabrous, 8-9 mm. long; corolla 18-20 mm. long; legume 6-11 cm. long, 2 cm. wide, glabrous, much inflated, reticulate-veined, on a stipe 5-8 mm. long; seeds light brown, 6 mm. long, 3 mm. wide.

Diphyssa wood, probably of this species, is used in the Jocotán (Chiquimula) region for making tobacco pipes. The plant is used to some extent in domestic medicine, although there is no reason for believing that it has any important medicinal properties.

Diphyssa spinosa Rydb. N. Amer. Fl. 24: 213. 1924. *Clarillo*.

Moist or dry thickets, sometimes on rocky oak-forested hillsides, 800-1,400 meters; Jalapa; Guatemala (Fiscal); Huehuetenango. Southern Mexico, the type from Canjob, Chiapas.

A shrub or small tree, 1-4 meters high or more, often forming dense thickets, the branches short and spinescent, sparsely pubescent when young and sometimes minutely prickly; leaf rachis puberulent and setulose with small broad-based hairs; leaflets 9-15, oval to oblong, mostly 4-8 mm. long, glabrous or nearly so, rounded at the apex, paler beneath; racemes 1-2-flowered, the bracts oblong or linear, the bractlets ovate, acute; calyx glabrous, 8 mm. long; corolla 10-12 mm. long; legume puberulent when young, glabrous in age, commonly 3-4.5 cm. long and 7 mm. wide, scarcely or not at all inflated, several-seeded, strongly compressed, easily breaking between the seeds and almost articulate.

This shrub is common in some places about Jalapa and Fiscal, where it forms dense interlaced thickets. The plants are leafless during the dry season, and at that time, because of the spinescent stiff stub-like branches, one would scarcely associate them with the more usual types of *Diphyssa*.

DOLICHOS L.

Usually scandent herbs; stipules and stipels present; leaves pinnately 3-foliate; flowers racemose, the flowers fasciculate at the enlarged nodes of the rachis; bracts and bractlets deciduous; calyx campanulate, 4-dentate, the upper segment emarginate or entire; corolla purple or white, the standard unguiculate, orbicular, 2-auriculate at the base; wings falcate-obovate, the keel incurved at a right angle, often rostrate; vexillar stamen free; ovary sessile, many-ovulate, the style barbate along the inner side, the stigma terminal; legume oblong or linear, strongly com-

pressed, 2-valvate, the margins often thickened; seeds thick or compressed, with a short or elongate hilum, strophiolate or naked.

Perhaps 25 species, chiefly in the Old World tropics. No species are native in North America.

Dolichos Lablab L. Sp. Pl. 725. 1753.

Probably native of tropical Africa. Cultivated widely in tropical and temperate regions for its seeds and young pods and as an ornamental plant; seen frequently in Guatemalan gardens, principally for ornament.

A large vine, glabrate; leaves on long slender petioles, the leaflets ovate-deltoid or ovate-rhombic, thin, green, 4–10 cm. long, often as wide as long, acute or acuminate, white-punctate above; racemes often greatly elongate, the flower clusters remote, the flowers short-pedicellate, 1.5–2 cm. long, purple or white; calyx sparsely pubescent, lobate to about the middle; legume falcate-oblong, about 7.5 cm. long and 2.5 cm. wide, the upper suture almost straight, the lower one curved and serrulate; seeds somewhat compressed, black, 1 cm. long, the hilum linear.

Known in the United States by the name “hyacinth bean”; “frijol,” “frijol de adorno” (Salvador). The green seeds and tender young pods are edible when cooked, but they are eaten little if at all in Central America.

DUSSIA Krug & Urban

Tall trees; stipules none or caducous; leaves large, odd-pinnate, not stipellate; racemes simple or paniculate, axillary and terminal, bracteate and bracteolate; calyx campanulate, 5-lobate, the segments imbricate, the 2 upper ones more or less connate; petals subequal, the standard orbicular, not auriculate; wings straight, the keel petals similar to the wings; stamens diadelphous, all fertile; ovary short-stipitate, about 4-ovulate, the style incurved at the apex, the stigma small, terminal; legume short-stipitate, ovoid or cylindric, turgid, lignescent, 2-valvate; seeds 1–3, oval, slightly compressed, arillate, the cotyledons thick, carnosae, the radicle very short.

About 10 species, ranging from Mexico to the Amazon Valley and Peru. One other species is known from Costa Rica and one from southern Mexico.

Dussia cuscatlanica (Standl.) Standl. & Steyerl. Field Mus. Bot. 22: 341. 1940. *Cashalia cuscatlanica* Standl. Journ. Wash. Acad. Sci. 13: 441. 1923 (type from Finca Colima, Ahuachapán, Salvador). *D. grandifrons* I. M. Johnston, Journ. Arnold Arb. 10: 118. 1938 (type from Colomba, A. F. Skutch 2027). *Soycol de monte*; *Palo de tigre*; *Granadillo de montaña*.

Moist or wet forest, 800–2,000 meters; Chimaltenango; Suchitepéquez; Quezaltenango; San Marcos. Salvador; Costa Rica; doubtless occurring in Chiapas.

A tall tree, sometimes 30 meters high with open spreading crown, the bark smooth, gray, the branchlets, petioles, and leaf rachis brown-hirsute; leaves often very large, as much as a meter long; leaflets alternate, about 19–25, chartaceous, short-petiolulate, chiefly oblong or lance-oblong and 15–25 cm. long, long-acuminate, obtuse or rounded at the base, green and glabrous above, paler beneath, densely velutinous-pilose with fulvous spreading hairs; panicles subterminal, fulvous-tomentulose, the branches long, ascending; bracts conspicuous, lanceolate, 7–10 mm. long; bractlets obovate, 5 mm. long, 3-dentate, acuminate; calyx 8 mm. long, brown-tomentose, oblique at the base, the teeth 2–4 mm. long, triangular; petals pale pink, the standard densely pubescent outside, 1.5 cm. long; legume 6–10 cm. long, subterete, acute at the base and apex, covered with a dense and fine, brown tomentum, on a stipe 6 mm. long; seeds ovoid, 3–4 cm. long, 2 cm. in diameter, subacute at the base, rounded at the apex.

Called “cashal” in Salvador, where it is said to be a timber tree of some importance. This species is the type of the genus *Cashalia* Standl., referred incorrectly when published to the Caesalpinieae, and so referred also by Britton and Rose in *North American Flora*.

ERIOSEMA De Candolle

Plants perennial, herbaceous or suffrutescent, usually erect or ascending; leaves pinnately 3-foliolate or 1-foliolate, usually without stipels, the leaflets resinous-punctate beneath; stipules lanceolate, free or connate; flowers chiefly yellow, the standard generally sericeous, solitary or geminate along the rachis of an axillary raceme, rarely solitary in the leaf axils; calyx lobes distinct or the 2 upper ones short-connate; standard obovate or oblong, with 2 inflexed auricles at the base; wings narrow, the keel slightly incurved at the apex, obtuse; vexillar stamen free, the others connate, the anthers uniform; ovary sessile, 2-ovulate, the style filiform or slightly thickened above, the stigma small, terminal; legume compressed, obliquely orbicular, rhombic, or broadly oblong, 2-valvate, continuous within, commonly 2-seeded; seeds compressed, obliquely transverse, not strophiolate.

About 100 species, in both hemispheres, almost all in the tropics. Only the following are known from Central America.

Leaves 1-foliolate..... *E. simplicifolium*.
Leaves 3-foliolate.

Racemes elongate, mostly longer than the leaves.

Leaflets linear or nearly so, several times as long as broad; flowers about 1 cm. long..... *E. violaceum*.

Leaflets oblong, about 3 times as long as broad; flowers about 2 cm. long.

E. grandiflorum.

Racemes short and head-like, mostly shorter than the leaves.

Pubescence of the lower leaf surface of mostly or wholly appressed hairs.

- Leaflets almost linear, attenuate, glabrous on the upper surface or nearly so, bright green. *E. pinetorum*.
- Leaflets narrowly oblong or almost linear-oblong, mostly obtuse or rounded at the apex, densely sericeous or strigose on the upper surface and usually grayish. *E. diffusum*.
- Pubescence of the lower leaf surface all or mostly of spreading hairs.
- Leaflets sparsely hirsute beneath with very long, lax hairs; hairs of the stems long and widely spreading. *E. crinitum*.
- Leaflets pilose beneath with short white hairs; hairs of the stems short, reflexed. *E. pulchellum*.

Eriosema crinitum (HBK.) G. Don, Gen. Syst. 2: 348. 1832.
Glycine crinita HBK. Nov. Gen. & Sp. 6: 421. pl. 573. 1824.

Grassy savannas or exposed hillsides, often in pine forest, 200–1,500 meters; Petén; Jutiapa. Honduras; Salvador; Costa Rica; Panama; Cuba; northern South America.

Perennial from a thick, hard, somewhat woody, vertical root, the stems usually numerous, erect to procumbent, mostly 30 cm. long or less, puberulent and also hirsute with very long, spreading hairs; stipules lanceolate, 1 cm. long or less, brown, dry; leaves subsessile, the 3 leaflets green, linear-oblong to oblong or obovate-oblong, mostly 3–7 cm. long, obtuse or acute, sparsely hirsute with long spreading fragile hairs, sometimes also puberulent; racemes axillary, much shorter than the leaves, few-flowered, head-like, sessile or nearly so; calyx hirsute with long spreading hairs; corolla 1 cm. long, yellow, the standard hirtellous or puberulent outside; legume obliquely oblong-ovate, 1–1.5 cm. long, pilose with very long, spreading hairs.

Called “guapito” in Salvador. This, like most other Central American species of the genus, is a characteristic plant of grasslands and open pine forest.

Eriosema diffusum (HBK.) G. Don, Gen. Syst. 2: 347. 1832.
Glycine diffusa HBK. Nov. Gen. & Sp. 6: 420. pl. 572. 1824. *Guapo*; *Guapillo*; *Carrillo* (Petén, fide Lundell); *Oreja de burro*; *Boca de león* (fide Aguilar).

Moist or wet savannas, or often in open places in pine-oak forest, 1,800 meters or less; Petén; Alta Verapaz; Baja Verapaz; Izabal; Zacapa; El Progreso; Jalapa; Santa Rosa; Chimaltenango; Quiché; Huehuetenango. Western and southern Mexico; British Honduras to Salvador and Panama; northern South America.

Plants usually stiffly erect, 70 cm. high or less, simple or branched, suffrutescent, the stems stiff, often several from each root, sericeous with chiefly appressed, whitish hairs, sometimes glabrate; leaves subsessile, the 3 leaflets oblong or linear-oblong, 2.5–7 cm. long, mostly obtuse, subcoriaceous, usually grayish above and densely sericeous, strigose beneath chiefly on the veins, resinous-dotted; racemes short and head-like, sessile or short-pedunculate, few-flowered, shorter than the

leaves; calyx appressed-hirsute with white hairs; corolla yellow tinged with purple, 7 mm. long, the standard finely sericeous; fruit oval, 1 cm. long or slightly larger, densely covered with very long, spreading, brown hairs.

Eriosema grandiflorum (Schlecht. & Cham.) Seem. Bot. Voy. Herald 345. 1857. *Rhynchosia grandiflora* Schlecht. & Cham. Linnaea 5: 588. 1830. *Miehlia*.

Jalapa (Jalapa, at about 1,400 meters, *Jesús Morales Ruano* 1345). Western and southern Mexico.

A stiffly erect shrub 1-2 meters high, the stout branches densely pilose with brownish, mostly ascending hairs; leaves subsessile, the 3 leaflets coriaceous, oblong or rather narrowly oblong, 4-9 cm. long, subacute to rounded at the apex, densely sericeous or strigose on both surfaces, the lateral nerves very prominent beneath, the veins prominent and reticulate; flowers large and showy, mostly in rather long racemes, these usually exceeding the leaves, the lower bracts numerous and densely imbricate, ovate, striate, acute or acuminate, sericeous, the flowers pedicellate, about 2 cm. long, yellow; calyx densely hirsute, with very narrow lobes; standard densely hirtellous or hirsute; legume almost 2 cm. long, densely covered with very long, spreading, brownish hairs.

Although rather widely distributed in Mexico, this species seems to be very rare in Guatemala.

Eriosema pinetorum Standl. Field Mus. Bot. 8: 315. 1931.

Grassy savannas or open wet pine forest, 300 meters or less; Petén. British Honduras (type from All Pines, *W. A. Schipp* 584).

An erect perennial from a hard woody root, the stems slender, simple or sparsely branched, 60 cm. high or less, sparsely puberulent and pilose with appressed or ascending, fulvous hairs; leaves sessile or nearly so, the 3 leaflets linear-attenuate, 5-10 cm. long, 5-8 mm. wide, green above, glabrous or sparsely scaberulous, appressed-hirsute beneath on the costa and margins; stipules brown, linear-attenuate, 14 mm. long or shorter; racemes head-like, short-pedunculate, few-flowered, much shorter than the leaves, the flowers short-pedicellate, yellow; calyx 6.5 mm. long, sparsely hirsute; standard 8 mm. long, sparsely hirtellous or puberulent; legume 13 mm. long, blackish, thinly hirsute with long spreading hairs.

Eriosema pulchellum (HBK.) G. Don, Gen. Syst. 2: 348. 1832. *Glycine pulchella* HBK. Nov. Gen. & Sp. 6: 422. 1824. *Oreja de conejo*; *Boca de león*; *Manía de monte* (Huehuetenango).

Open, sometimes brushy, often rocky slopes, most frequent in pine-oak forest, 1,200-2,000 meters; Zacapa; Jalapa; Guatemala; Sacatepéquez; Chimaltenango; Sololá; Huehuetenango. Mexico; Honduras; Colombia.

An erect or ascending perennial from a hard woody root, herbaceous or suffrutescent, the stems simple or sparsely branched, 50 cm. high or less, densely

pilose with short white reflexed hairs; leaves sessile or nearly so, the 3 leaflets oblong or lance-oblong, 3-7 cm. long, rounded to subacute at the apex, rounded at the base, rugose, short-hirsute above with whitish hairs, short-hirsute beneath, chiefly on the veins, the leaves often grayish, the veins prominent and reticulate beneath; racemes short and head-like, few-flowered, sessile or pedunculate, shorter than the leaves; calyx densely pilose; corolla yellow, turning purplish in drying, the standard 8 mm. long, densely pubescent outside; legume about 13 mm. long, short-rostrate, densely covered with long spreading brownish hairs.

The lower leaves often are 1-foliate.

Eriosema simplicifolium (HBK.) G. Don, Gen. Syst. 2: 348. 1832. *Glycine simplicifolia* HBK. Nov. Gen. & Sp. 6: 419. 1824.

Chimaltenango (Finca La Alameda, 1,800 meters, *J. R. Johnston* 748). Costa Rica; northern South America.

Plants herbaceous, perennial from a thick woody root, the stems decumbent or erect, slender, pilose with long spreading hairs; leaflet only 1, almost sessile, oblong or ovate-oblong, 3-8 cm. long, obtuse, rounded or subcordate at the base, prominently reticulate-veined, thinly pilose with very long, spreading, weak hairs; racemes short and head-like, usually shorter than the leaves, few-flowered, the peduncles sometimes elongate and 2-4 cm. long, the pedicels 7 mm. long or less; calyx pilose, 7 mm. long, the lobes subulate, much longer than the tube; corolla yellow, the standard 10-13 mm. long, puberulent outside; legume broadly ovate, 15 mm. long or shorter, 8 mm. broad, densely pilose.

Apparently rare in Central America, and known there from very few collections.

Eriosema violaceum (Aubl.) G. Don, Gen. Syst. 2: 347. 1832. *Cytisus violaceus* Aubl. Pl. Guian. 766. pl. 306. 1775.

In savannas, 70 meters; Izabal (near Cristina, *Steyermark* 38683). Tabasco (Palenque); northern South America.

Plants erect, frutescent, 1.5 meters high or less, slender, appressed-pilose; leaves sessile, the 3 leaflets linear, 4-9 cm. long, obtuse or subacute, appressed-pilose on both surfaces, the margins strongly revolute, the nerves very prominent beneath; racemes rather lax and elongate, 6 cm. long or shorter, sometimes longer than the leaves, the pedicels 2 mm. long; calyx 4 mm. long, densely appressed-pilose, the narrow teeth about equaling the tube; petals yellow, the standard 8 mm. long, pubescent outside; legume ovate, 1-1.5 cm. long, densely pilose with spreading brownish hairs; seeds black, lustrous.

ERYTHRINA L.

Reference: B. A. Krukoff, The American species of *Erythrina*, Brittonia 3: 205-337. 1939.

Trees or shrubs, rarely herbs, the young branches thick, aculeate; stipules small; leaves pinnately 3-foliate, the leaflets large and broad, the stipels gland-

like; flowers large, red or orange, in axillary or terminal racemes, these often leafy at the base; bracts and bractlets small or none; calyx obliquely truncate or variously dentate or lobate; standard large or long and narrow, erect or spreading, subsessile or long-stipitate, not appendaged at the base; wings short, sometimes none; keel much smaller than the standard, longer or shorter than the wings, the petals free or dorsally connate; vexillar stamen free or united at the very base with the others, the anthers uniform; ovary stipitate, many-ovulate, the style incurved, subulate at the apex, naked, the stigma small, terminal; legume stipitate, linear, falcate, attenuate at each end, compressed or subterete, usually constricted between the seeds, 2-valvate, sometimes opening only along the upper suture; seeds ovoid, the hilum lateral, estrophiolate.

About 100 species, in the tropics of both hemispheres, about half of them American. A few besides those listed here are found in southern Central America.

Standard borne on a claw 9 mm. long or longer, orange; leaflets rounded at the apex; seeds dull, brown or blackish with black markings.....*E. glauca*.

Standard short-unguiculate, usually red, orange in one species; leaflets mostly acute or acuminate; seeds not as above.

Flowers orange; wings one-third as long as the keel or shorter; seeds brown.
E. Poeppigiana.

Flowers red; wings about equaling the keel; seeds red or red and black.

Calyx brown-villous even in anthesis, the hairs often branched, not or scarcely shorter on the vexillar side; leaflets more or less villous in age along the nerves.....*E. macrophylla*.

Calyx glabrate to densely short-pubescent, not villous, often much shorter on the vexillar side; leaflets not villous beneath.

Calyx short, 8-12 mm. long.....*E. Standleyana*.

Calyx 14-30 mm. long.

Leaflets persistently arachnoid-tomentose beneath with long, closely appressed hairs.....*E. hondurensis*.

Leaflets glabrous beneath or nearly so, at least in age, without arachnoid pubescence.

Calyx glabrous or practically so, at least in anthesis.

Calyx conspicuously oblique at the mouth, conspicuously shorter on the vexillar side.....*E. mexicana*.

Calyx not oblique at the mouth or scarcely so, of about the same length on both sides.....*E. Berteroana*.

Calyx densely brown-pubescent or tomentulose.

Standard pubescent outside, at least in bud; keel about equaling the wings.....*E. Folkersii*.

Standard glabrous; keel conspicuously shorter than the wings.
E. guatemalensis.

Erythrina Berteroana Urban, Symb. Antill. 5: 370. 1908. *Pito*; *Miche*; *Machetillos* (flowers); *Coralillo*; *Tzinté* (Cobán, Quiché); *Tzite* (Quiché).

Wet to dry thickets or thin forest, abundant in hedges and fence-rows, 2,000 meters or less, most common at 1,000 meters or lower;

Petén; Alta Verapaz; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Chimaltenango; Sololá; Retalhuleu; Quezaltenango; Huehuetenango. Southern Mexico; Honduras and Salvador to Panama; West Indies; Colombia.

A tree, usually 10 meters high or less, abundantly armed with stout spines; leaflets broadly rhombic-ovate or rhombic-orbicular, 5-15 cm. long, acute or short-acuminate or sometimes almost rounded, glabrous or nearly so, pale beneath; calyx subcoriaceous, tubular, 20-26 mm. long on the carinal side, 16-23 mm. on the vexillar side, puberulent at first but soon glabrate; standard pale or deep red, 5.5-9.5 cm. long, 9-16 mm. wide, usually obtuse; wings slightly longer than the keel or equaling it, 7.5-14 mm. long; pods somewhat ligneous, 11-28 cm. long, 1.5 cm. broad, deeply constricted between the seeds, arcuate or coiled or often much twisted at maturity, long-stipitate and long-rostrate; seeds usually numerous, scarlet, with a short black line extending from the hilum, 1 cm. long.

This has been reported from Guatemala as *E. corallodendron* L. and *E. rubrinervia* HBK. It appears to be the commonest species of *Erythrina* in Guatemala and is abundant almost anywhere at low and middle elevations, especially in fence-rows, where it often is planted for living fence-posts, a purpose that it serves admirably, the trunks being solid in the ground and long-lived. The bark is pale, smooth, and often covered with small lichens. The bark and wood are so hard that it is difficult to remove the lichens when they are desired for specimens. The usual name almost throughout Central America is "pito," and this appears in Guatemalan place names, such as El Pito, a *caserío* of Guatemala, and Los Pitos, a *caserío* of Chimaltenango. The young leaves, branchlets, and unopened flowers are in common use as a vegetable, usually, it is said, being boiled in two waters, which makes them probably safer for eating. The buds often are cooked like string beans, which they somewhat resemble as they appear on the table. Large quantities of the flower buds are on sale in the markets, sometimes in regions where the tree does not grow, as at Quezaltenango. The handsome seeds of this and related species are often used for making bracelets, necklaces, and other decorative articles. They have long been known to be poisonous, and in recent years there have been obtained from them several alkaloids, some of which resemble curare in their physiological action. The crushed branches are reported to have been used as a fish poison. A decoction of the young shoots is sometimes employed as a narcotic. There is a belief in Guatemala and Honduras that if leaves are placed under a pillow, they induce deep and refreshing sleep, a statement that needs further investigation before it is accepted as true! The Chorti Indians of Chiquimula are said to plant *Erythrina* trees as boundary markers for their land.

The bark yields a yellow dye used to color textiles. In spite of the fact that the trunks of growing trees are very solid and hard, the dry wood is light and soft, with a specific gravity of about 0.25. It is employed locally as a substitute for cork, for carving images of saints or small toys, and for other similar purposes. Guatemalan Indian names reported for *Erythrina* of this or other species include the following: "hutacán" (Baja Verapaz); "sité" (Chimaltenango); "tzité" (Totonicapán). A *municipio* of Quiché is called Patzité, signifying "place of *Erythrina* trees." A special term "ahzite" or "ajzite" is applied by the Quiché people to the *brujos* (medicine men) who produce spells by means of *Erythrina* seeds.

Erythrina Folkersii Krukoff & Moldenke, *Phytologia* 1: 286. 1938. *Pito*.

Moist or wet thickets, 350 meters or lower; Alta Verapaz; Izabal. Southern Mexico; British Honduras (type from El Cayo District, *H. H. Bartlett* 11513).

A tree, 12 meters high or less, the trunk as much as 25 cm. in diameter, the bark smooth or nearly so, pale, the inner bark greenish, the trunk and branches armed with stout spines; leaflets chartaceous, broadly ovate or deltoid-ovate to rhombic, 9–20 cm. long, acute or acuminate, glabrous above, sparsely pubescent beneath with short hairs or almost glabrous, minutely farinose-ceriferous; calyx chartaceous, campanulate, 14–25 mm. long on the carinal side, 10–19 mm. on the vexillar side, appressed-tomentulose; standard scarlet, 4.5–8.5 cm. long, 9–19 mm. wide, rounded at the apex; wings slightly shorter or longer than the keel, 7–10 mm. long; legume somewhat ligneous, 10–27 cm. long, 1.3–1.8 cm. thick, moniliform, long-stipitate; seeds usually numerous, sometimes only 2–3, scarlet, with a short black line extending from the hilum.

Called "equelite," "colorín," and "sumpante" in Oaxaca and Veracruz; "coral tree," "tiger tree" (British Honduras). The wood is deep yellowish brown, but when exposed to the air the heartwood becomes darker in color. This has been reported from British Honduras and Guatemala as *E. rubrinervia* HBK., a South American species. The standard petal of the flower is much used by boys for making a kind of whistle (*pitillo*); hence, it is said, the name *pito*, given commonly to the Central American species of *Erythrina*.

Erythrina glauca Willd. *Ges. Nat. Freund. Berlin Neue Schrift.* 3: 428. 1801.

Usually in low wet forest, often in swamps, 700 meters or less; Izabal; Jutiapa; Escuintla; Suchitepéquez. Cultivated in British Honduras; Honduras and Salvador to Panama; West Indies; southward to the Amazon Valley.

A large or medium-sized tree, the crown spreading, the trunk short, armed with spines; leaflets coriaceous, ovate to broadly ovate or elliptic, 8–15 cm. long, usually rounded at the apex, glabrous or nearly so, pale beneath; calyx chartaceous, broadly campanulate, asymmetric, 12–17 mm. long on the carinal side, 10–14 mm. on the vexillar side, 15–19 mm. broad at the apex, pubescent; standard orange, 4.7–6.5 cm. long, 3.5–5.8 cm. wide, emarginate at the apex; wings 22–33 mm. long, smaller than the keel; legume ligneous, 14–33 cm. long, 14–18 mm. thick, slightly constricted between the seeds; seeds dull, umber to blackish with black markings, 12–18 mm. long.

Known in Salvador as “ahuijote” or “ahuejote”; “guiliqueme” (Honduras). This tree is sometimes planted in Guatemala, perhaps for ornament or as a shade tree. It is very showy when covered with the large, bright orange flowers. In southern Central America and in South America it is utilized at times as a coffee shade. Nowhere in Guatemala have we found the tree so plentiful as it is along the Pacific coast of Panama, where it often is dominant on swampy land. The leaflets assume a vertical position in the evening, resuming their normal position in the morning.

Erythrina guatemalensis Krukoff, Amer. Journ. Bot. 28: 688. 1941. *Pito*; *Tzintej*.

Wet thickets or pastures, often in hedges, 1,200–1,600 meters; endemic; Alta Verapaz; Baja Verapaz (type from Patal, *Standley* 69600).

A small tree, armed with short stout spines; leaflets chartaceous, broadly ovate or rhombic-ovate, 5–10 cm. long, acute or short-acuminate, soon glabrate; calyx coriaceous, tubular, 19–30 mm. long on the carinal side, 16–22 mm. on the vexillar side, 8–10 mm. broad at the apex, densely pubescent with short brown hairs; standard deep red, 6.5–8 cm. long, 11–18 mm. wide, obtuse; wings 14–19 mm. long, conspicuously longer than the keel; legume somewhat ligneous, about 17 cm. long and 1.5 cm. thick, deeply constricted between the seeds, long-stipitate; seeds 2–many, scarlet, with a black line extending from the hilum.

This species is noteworthy for its fire-red flowers. It may be noted that in Central America *Erythrina* flowers are generally deep bright red at higher elevations but usually pale or dull red or merely greenish pink in the tierra caliente; thus the trees are much more conspicuous at higher levels. About Cobán, during dry weather at least, the leaflets of *E. guatemalensis* often are pendent and concave, as in the box elder, *Acer Negundo*. Dieseldorff states that the bark, flowers, and leaves are used by the Cobán Indians to produce a hypnotic sleep, and that the seeds are employed for divination by the local *brujos*, so numerous in Alta Verapaz, who are a combination of magician and medicine man.

Erythrina hondurensis Standl. Field Mus. Bot. 4: 309. 1929.

Wet forest, 150 meters or less; Izabal (between Morales and Montaña del Mico, *Steyermark* 39080). Atlantic coast of Honduras (type collected near Tela); Nicaragua.

A shrub or small tree, armed with spines; leaflets thin, deltoid to rhombic-ovate, 10–30 cm. long, acuminate, green above, pale beneath, persistently arachnoid-tomentulose beneath with long slender whitish appressed hairs; calyx subcoriaceous, campanulate, 14–23 mm. long on the carinal side and of about the same length on the vexillar side, 7.5–10 mm. broad at the apex, appressed-tomentulose when young, soon glabrate; standard scarlet, 5–8 cm. long, 9–16 mm. wide, rounded at the apex; wings 6.5–9.5 mm. long, the keel of the same length; legume somewhat ligneous, 14–30 cm. long, 14–18 mm. thick, moniliform; seeds numerous, scarlet, 9.5–13 mm. long.

Called “pito” and “gualiquemi” in Honduras; “elequemito” (Nicaragua). The single Guatemalan collection consists of young leaves only, but the pubescence of this species is so distinctive that there is little doubt that the material is properly referable here.

Erythrina macrophylla DC. Prodr. 2: 411. 1825. *Pito*; *Machetillos* (flowers); *Miche*, *Ucún* (Huehuetenango).

Open hillsides or brushy slopes, 1,200–2,500 meters; known at present only from Guatemala, having been described from plants cultivated in the Canary Islands; Alta Verapaz; El Progreso; Zacapa; Guatemala; Sacatepéquez; Chimaltenango; Sololá; Huehuetenango; Quezaltenango; San Marcos.

A tree, sometimes 15 meters high, usually lower, armed with stout spines; leaflets subcoriaceous or thinner, broadly ovate-rhombic or broadly ovate, often wider than long, 8–15 cm. long, acute, rufous-villous at first but soon glabrate, some of the brown hairs persisting beneath along the nerves; calyx subcoriaceous, campanulate, 13–19 mm. long on the carinal side, of about the same length on the vexillar side, 7–9 mm. broad at the apex, densely brown-villous, the hairs often branched; standard 4–7.5 cm. long, 1–1.5 cm. wide, obtuse; wings 6.5–11 mm. long, longer than the keel; legume somewhat ligneous, 15–22 cm. long, 15–18 mm. thick, irregularly constricted between some of the seeds; seeds 2–many, scarlet, with a black line extending from the hilum, 11–18 mm. long.

Erythrina mexicana Krukoff, Brittonia 3: 309. 1939. *Pito*; *Ermitché* (San Marcos).

Open or rather dense forest or thickets, 600–1,500 meters; Alta Verapaz; Escuintla; Suchitepéquez; Sololá; Quezaltenango; San Marcos. Southern Mexico.

A large shrub or small tree, 8 meters high or less, the trunk and branches armed with stout spines; leaflets rhombic-ovate or deltoid-ovate, 12–25 cm. long, thin, acuminate or long-acuminate, glabrous or nearly so, deep green above, pale

beneath; calyx thin-chartaceous, tubular-campanulate, 19–29 mm. long on the carinal side, 14–25 mm. on the vexillar side, 6–7 mm. broad at the apex, sparsely and minutely pubescent when young, glabrous at anthesis; standard bright red, narrowly oblanceolate, 6–8 cm. long, 12–15 mm. wide, rounded at the apex; wings 8–10 mm. long, equaling or slightly longer than the keel; legume somewhat ligneous, 17–50 cm. long, 16–22 mm. thick, constricted between the seeds, long-stipitate; seeds usually numerous, scarlet, 11–15 mm. long.

Erythrina Poeppigiana (Walp.) O. F. Cook, Bull. U. S. Dept. Agr. Bot. 25: 57. 1901. *Micropteryx Poeppigiana* Walp. Linnaea 23: 740. 1850. *E. micropteryx* Poepp. ex Urban, Symb. Antill. 1: 327. 1899. *Pito extranjero*.

Native in Panama and southward to Bolivia; sometimes cultivated in Central America, and in some regions naturalized, as in Costa Rica; in Guatemala planted and perhaps more or less naturalized in Alta Verapaz and Santa Rosa, and doubtless in other departments.

A tall tree, often 20 meters high or more, armed with stout spines; leaflets rhombic-ovate to deltoid-ovate or rounded, 9–20 cm. long, acute to obtuse, glabrous or somewhat puberulent beneath; calyx chartaceous, campanulate, 5.5–10 mm. long, 5–8 mm. wide at the apex, puberulent; standard bright orange, elliptic, 3.5–5.5 cm. long, 13–21 mm. wide; wings 7–14 mm. long; keel 31–45 mm. long; legume chartaceous, 13–25 cm. long, 11–14 mm. thick, not constricted between the seeds; seeds usually numerous, coffee-colored, without markings, 10–17 mm. long.

This species has been planted in some parts of Central America as shade for cacao and coffee, and it may have been so used in Guatemala, although the trees become too large to be satisfactory for the purpose. They are very showy when bearing their abundant orange-colored flowers.

Erythrina Standleyana Krukoff, Brittonia 3: 301. 1939. *Pito*.

Open forest, 300 meters or less; Petén. Yucatan Peninsula of Mexico; British Honduras; Cuba.

A small tree, armed with stout spines; leaflets chartaceous, broadly ovate to suborbicular or deltoid-ovate, 4–13 cm. long, acuminate or acute, at first arachnoid-tomentulose but soon glabrate; calyx chartaceous, campanulate, 8–12 mm. long on the carinal side, of about the same length on the vexillar side, 4–6.5 mm. broad at the apex, sparsely pubescent or glabrate; standard red, narrowly elliptic, 3.5–6.5 cm. long, 8–12 mm. wide, rounded or obtuse at the apex; wings 7–12 mm. long, longer than the keel; legume 9–20 cm. long, 11–14 mm. thick, deeply constricted between the seeds; seeds 1–many, scarlet, with a black line extending from the hilum, 9–12 mm. long.

This and other species are known in British Honduras as “coama wood,” “tiger wood,” “colorín,” “sumpancle,” and “chacmolche”

(Maya); sometimes called "piñón espinoso" in Yucatan. *E. Standleyana* has been reported from Petén as *E. americana* Mill. and from British Honduras as *E. rubrinervia* HBK.

EYSENHARDTIA HBK.

Reference: Francis W. Pennell in Rydb. N. Amer. Fl. 24: 34–40. 1919.

Shrubs or trees, unarmed; leaves pinnate, the leaflets usually numerous, glandular-punctate; flowers small, white, in loosely clustered, terminal, spike-like racemes; calyx unequally lobate, the anterior lobe longest, the tube cleft more deeply between the posterior lobes; corolla almost regular, the petals subequal, oblanceolate or obovate; stamens 10, diadelphous, the filaments united for half their length; ovary sessile, 2–4-ovulate, the style slender, more or less pubescent, with a conspicuous gland near the apex, sometimes glandless, the stigma large, capitate; legume small, indehiscent; seed 1, pendulous, the hilum near the distal end.

Fourteen species are recognized by Pennell, but the true number is doubtless less. All are natives of Central America, Mexico, and southwestern United States. Only the following occurs in Central America.

Eysenhardtia adenostylis Baill. *Adansonia* 9: 239. 1870. *Wiborgia adenostylis* Kuntze, Rev. Gen. 231. 1891. *Viborquia adenostylis* Cockerell, Bull. Amer. Mus. Nat. Hist. 24: 97. 1908. *Taray*.

Dry thickets or in open dry forest, often on limestone, 1,100–2,200 meters; type collected in Guatemala by Savage, the locality not known; Escuintla; Santa Rosa; Sacatepéquez; Chimaltenango; Huehuetenango. Salvador.

A small or rather large tree, sometimes 12 meters high with a trunk 30 cm. in diameter, the young branchlets cinereous-puberulent; stipules subulate, 2–3 mm. long; leaflets about 41, oblong, 1.5–2.5 cm. long, rounded at the apex, rather thick, green above and glabrous or nearly so, paler beneath, puberulent, brown-punctate; racemes 4–12 cm. long; calyx tube 2.5 mm. long, puberulent, the lobes minute, subacute; petals 5 mm. long; legume 17–20 mm. long, 3.5 mm. wide, pale brown, glabrous, sparsely punctate, spreading or ascending at maturity.

This has been reported from Guatemala as *E. amorphoides* HBK., a synonym of *E. polystachya* (Ort.) Sarg., a Mexican species. The wood of the latter has long been celebrated in Mexico for its unusual physical properties and for almost miraculous medicinal properties ascribed to it (see W. E. Safford, *Lignum nephriticum*—its history and an account of the remarkable fluorescence of its infusion, Smithsonian Rept. 1915: 271–298). When an infusion of the wood

is examined by transmitted light, it exhibits a handsome opalescence, with all the colors of the rainbow. Under the name *lignum nephriticum* the wood was exported for centuries from Mexico to Europe, where it obtained a high reputation as a remedy for kidney diseases. The infusion was drunk from bowls or cups carved from the wood, which imparted its properties directly to the water. One other wood, *Pterocarpus indicus* Willd. of the Philippine Islands, is known to have similar properties. The wood is reported also to give a yellowish brown dye. It is hard and heavy, reddish brown, with a specific gravity of about 0.87.

GALACTIA P. Browne

Herbs or shrubs, prostrate or twining, rarely erect shrubs; leaves pinnately 3-foliolate, stipellate, the stipules small, often deciduous; flowers small or rather large, arranged in axillary racemes, geminate or fasciculate, or sometimes solitary in the leaf axils, the rachis of the inflorescence nodose; bracts small, setaceous, the bractlets minute; flower buds acuminate; calyx lobes acuminate, the 2 upper ones connate to form one entire lobe, the lateral lobes shorter, the lowest lobe usually longest; standard ovate or orbicular, the margins obscurely inflexed at the base or subappended; wings narrow or obovate, adherent to the keel, the keel about as long as the wings, not rostrate; vexillar stamen free or connate at the middle with the others, the anthers uniform; ovary subsessile, many-ovulate, the style filiform, not barbellate, the stigma small, terminal; legume linear, straight or incurved, flat and compressed or rarely with convex valves, 2-valvate, subseptate within between the seeds; seeds not strophiolate.

About 80 species in tropical and subtropical regions of both hemispheres. Probably no other species are known from Central America.

Leaves digitately 3-foliolate, the petiolules equal in length, all arising from the end of the rachis; leaflets linear.....*G. anomala*.

Leaves pinnately 3-foliolate, one at the end of the rachis, the 2 others arising from the side of the leaf rachis below the apex; leaflets usually broader than linear.

Leaflets acuminate.

Leaflets densely white-pilose beneath; flowers racemose.....*G. discolor*.

Leaflets glabrous or nearly so; flowers solitary in the leaf axils. *G. sparsiflora*.

Leaflets all or mostly obtuse or rounded at the apex.

Leaflets glabrous on the upper surface, or with a few inconspicuous hairs only along the costa.....*G. acapulcensis*.

Leaflets puberulent, scaberulous, or sericeous on the upper surface, often very densely so.

Racemes mostly much longer than the leaves, the rachis often greatly interrupted, the flower clusters remote.....*G. striata*.

Racemes mostly about equaling the leaves or shorter, sometimes slightly longer, the flowers usually somewhat crowded and dense.

Leaflets densely silvery-sericeous beneath with closely appressed hairs; pubescence of the raceme rachis of closely appressed hairs.

G. argenea.

Leaflets densely pilose beneath with rather lax, not closely appressed hairs; pubescence of the raceme rachis of spreading hairs.

G. multiflora.

Galactia acapulcensis Rose, Contr. U. S. Nat. Herb. 5: 137. 1897. *Sach-cam* (Huehuetenango).

Moist or rather dry thickets or thin forest, 2,100 meters or less; Alta Verapaz; Chiquimula(?); Santa Rosa; Escuintla; Huehuetenango. Western Mexico.

A very slender, herbaceous vine, the stems sparsely pilose with short spreading hairs or glabrate; stipules minute, subulate; leaflets short-petiolulate, thin, oblong-elliptic or oblong-ovate, 4–5 cm. long, obtuse, rounded at the base, green and glabrous above or essentially so, paler beneath and thinly strigillose; racemes equaling or often much longer than the leaves, very slender, interrupted, the flowers short-pedicellate, rose-purple, about 1 cm. long; calyx rather sparsely strigillose; legume 4–5 cm. long, 5–6 mm. wide, somewhat falcate near the apex, obliquely mucronate, densely puberulent, sparsely short-hirsute along the middle of the valves.

Galactia anomala Lundell, Contr. Univ. Mich. Herb. 6: 26. 1941.

Known only from the type: British Honduras, El Cayo District, mountain pine ridge, sandy pine uplands, San Agustín, *C. L. Lundell* 6901.

Plants perennial, herbaceous, twining, the stems filiform; leaves digitately 3-foliate, strigose; stipules subulate, 2.5 mm. long; petioles filiform, 4 cm. long or shorter; leaflets linear, 2–5 cm. long, 2–3 mm. wide, subobtusely, apiculate, acuminate at the base; flowers solitary in the leaf axils, the pedicels 2 mm. long, strigose; calyx strigose, 9 mm. long, the lobes acute or acuminate; corolla purplish, the standard 12 mm. long; style glabrous; legume linear, strigose, 3–3.5 cm. long, 4–5 mm. wide.

Galactia argentea Brandeg. Univ. Calif. Publ. Bot. 6: 181. 1915.

Rocky slopes, sometimes on limestone, 200–800 meters; Zacapa (near Zacapa); Huehuetenango. Oaxaca.

A small vine, suffrutescent, the stems densely white-sericeous; leaflets thick, reticulate-veined, oval to rounded-ovate, 2–4 cm. long, rounded and emarginate at the apex, rounded at the base, densely white-sericeous on both surfaces, the pubescence lustrous beneath; racemes mostly equaling or somewhat shorter than the leaves, few-flowered, the flower clusters remote, the flowers short-pedicellate; calyx densely white-sericeous, 6–7 mm. long; corolla purple, twice as long as the calyx; legume 4 cm. long, 5–6 mm. wide, the margins strongly thickened, densely sericeous, few-seeded.

The status of this species is somewhat uncertain. It may not be distinct from *G. Wrightii* Gray of northern Mexico. It may be remarked that all the American species are in need of revision, which probably will result in many name changes, and in the reduction of numerous species.

Galactia discolor Donn. Smith, Bot. Gaz. 16: 194. 1891. *Periandra parviflora* Micheli, Bull. Herb. Boiss. 2: 444. pl. 14. 1894 (type from Cerro Gordo, Santa Rosa, Heyde & Lux 3736). *G. minarum* Standl. & Steyermark. Field Mus. Bot. 22: 342. 1940 (type from Sierra de las Minas, between Río Hondo and Finca Alejandría, Steyermark 29640). *Choreque de culebra*.

Exposed rocky mountain slopes, often in pine-oak forest, 1,200–2,200 meters; endemic; Baja Verapaz; Zacapa; Jalapa; Santa Rosa; Guatemala; Huehuetenango.

Plants decumbent or scandent, herbaceous or suffrutescent, the slender stems pilose with short spreading hairs; leaves long-petiolate, the leaflets lance-oblong or ovate-oblong, 5–9 cm. long, 2–3.5 cm. wide, usually long-acuminate, obtuse at the base, short-pilose above and punctulate, paler beneath, densely or sparsely appressed-pilose or sericeous; racemes much shorter than the leaves or sometimes surpassing them, few-many-flowered, short-pedunculate, the rachis densely white-pilose, the pedicels 3 mm. long or less; calyx densely white-pilose, 6–8 mm. long; petals rose-purple, glabrous, the standard 12 mm. long; style very long, glabrous; legume 3.5 cm. long, 7 mm. wide, short-pilose.

Galactia multiflora Robinson, Proc. Amer. Acad. 29: 315. 1894.

Dry rocky open slopes, often in pine forest, 250–1,200 meters; Zacapa; Jutiapa. Western and southern Mexico.

Plants herbaceous or frutescent, usually twining, sometimes suberect, the slender stems densely pilose with short spreading white hairs; leaflets oblong to suborbicular, 2–5 cm. long, usually rounded at the apex, reticulate-veined and somewhat rugose, pale, thinly appressed-pilose above, paler beneath, densely pilose with mostly spreading hairs; racemes dense and many-flowered, usually shorter than the leaves and sessile or nearly so; calyx 6–7 mm. long, densely pilose with spreading white hairs; corolla purple, the standard 12 mm. long; legume 3–4 cm. long, 5–6 mm. wide, densely whitish-strigose, short-rostrate, the valves thick and with thickened margins.

Galactia sparsiflora Standl. & Steyermark. Field Mus. Bot. 23: 162. 1944.

Chiefly in pine forest, 2,000–3,000 meters; endemic; El Progreso (type collected in forest east of Finca Piamonte, Sierra de las Minas, Steyermark 43837).

A slender herbaceous vine, the stems terete, sparsely strigose or almost glabrous; stipules subulate, 2-2.5 mm. long, erect, persistent; leaves 3-foliate, on slender petioles 1.5-4 cm. long, the rachis 3-8 mm. long; leaflets chartaceous, oblong-lanceolate or narrowly oblong, usually broadest at or below the middle but sometimes widest slightly above the middle, 3-6.5 cm. long, 8-15 mm. wide, acute or acuminate, obtuse or rounded at the base, lustrous, green above, sparsely scabrous-strigose, slightly paler beneath, sparsely scabrous-strigose or almost wholly glabrous, the veins elevated and closely reticulate on both surfaces; peduncles axillary, 1-flowered, 5-7 mm. long; calyx 4-5 mm. long, turbinate, appressed, 4-dentate almost to the middle, the dorsal tooth ovate, subobtusate, entire, the lowest one narrower, acuminate, of the same length, the 2 lateral ones shorter, ovate, acuminate; legume sessile, narrowly oblong or linear-oblong, 2.5-3 cm. long, 4-5 mm. wide, acute and abruptly long-rostrate, gradually attenuate to the base, elastically dehiscent, sparsely strigose, subseptate; seeds 2-3, somewhat compressed, lustrous, broadly oval, 4 mm. long, brown mottled with black.

Known only from fruiting plants, and the generic position somewhat uncertain. In general appearance they are much like *Calopogonium lanceolatum* Brandeg., but they represent a different species, and on the basis of calyx characters are better referable to *Galactia* than to *Calopogonium*. These genera are not always easily separable.

Galactia striata (Jacq.) Urban, Symb. Antill. 2: 320. 1900.
Glycine striata Jacq. Hort. Vindob. 1: 32. pl. 76. 1770.

Dry or wet, open hillsides, usually in pine forest, 1,500 meters or less; Izabal; Zacapa; Huehuetenango. Mexico; British Honduras; Honduras; Nicaragua; Costa Rica; Panama; West Indies; South America.

A small or rather large, herbaceous vine, the slender stems pilose with short, reflexed or spreading hairs; stipules subulate, 2-4 mm. long; leaflets thin, ovate-elliptic to broadly elliptic, sometimes oblong, 3-5.6 cm. long, rounded or very obtuse at the apex, rounded at the base, green above, sparsely appressed-pilose or glabrate, paler beneath, densely pilose with pale, appressed or spreading hairs; racemes often much longer than the leaves but sometimes short and few-flowered, interrupted, the pedicels 2-2.5 mm. long; calyx appressed-pilose, 5-7 mm. long; flowers purple or purplish, the standard 8-9 mm. long; legume straight or sub-falcate above, 4-7 cm. long, 7-9 mm. wide, densely short-pilose; seeds 3.5-4 mm. long, brown, obscurely mottled or blackish.

Maya names reported from Yucatan are "xichilax" and "caxabyuc." Material now referred to *G. striata* is highly variable, but in the West Indies the species appears to be equally variable (see Urban, Symb. Antill. 2: 320 et seq. 1900). Collections from Central America and Mexico often have been referred to *G. tenuiflora* Willd., a species not known from North America.

GLIRICIDIA HBK.

Unarmed trees or shrubs; leaves odd-pinnate, not stipellate, with small stipules; flowers rather large and showy, mostly pink, often appearing before the leaves, in axillary racemes, the bracts small, deciduous; bractlets none; calyx short-campanulate, as broad as long, truncate, the teeth 5, short and broad or obsolete; standard orbicular, reflexed, often with 2 callosities at the base of the blade, short-unguiculate; wings oblong-oblancoolate, erect, free, the keel petals strongly arcuate above the middle, obtuse, united at the apex; stamens diadelphous, the anthers uniform; ovary stipitate, 7-12-ovulate, the style glabrous, inflexed at almost a right angle; stigma capitate, papillose; legume linear, short-stipitate, compressed, 2-valvate; seeds suborbicular, compressed.

About 5 species, in tropical America. Only the following are known from Central America.

Corolla 1.5-2 cm. long; leaflets mostly 2-7 cm. long; 3 lower calyx lobes distant.

G. sepium.

Corolla 1-1.5 cm. long; leaflets mostly 1-3 cm. long; 3 lower calyx teeth close together.

Leaflets appressed-pilose beneath..... *G. guatemalensis.*

Leaflets glabrous beneath except on the costa..... *G. meistophylla.*

Gliricidia guatemalensis Micheli, Bull. Herb. Boiss. 2: 442. *pl.* 10. 1894. *Flor de cruz* (Huehuetenango).

Brushy hillsides, about 1,300-2,000 meters; Huehuetenango; Quiché (type from Sacabajá, 1,350 meters, *Heyde & Lux* 3315); Quezaltenango (reported from Aguas Calientes near Sija); endemic.

A shrub or small tree, the branchlets sparsely appressed-pilose at first, glabrous in age; stipules lanceolate, 5-10 mm. long; leaflets 15-19, ovate or oblong, 1.5-4 cm. long, 8-18 mm. wide, rounded and mucronate at the apex, rounded at the base, glabrous above, pale beneath and appressed-pilose; racemes on short axillary branches, 8-10 cm. long, the bracts minute; calyx 5-8 mm. long, puberulent above, 5-lobate; corolla 12-15 mm. long; ovary 7-8-ovulate, the style inflexed, glabrous; legume 6-7 cm. long, 1-1.2 cm. wide, glabrous; seeds dark brown.

Gliricidia meistophylla (Donn. Smith) Pittier, Contr. U. S. Nat. Herb. 20: 86. 1917. *Lonchocarpus meistophyllus* Donn. Smith, Bot. Gaz. 56: 55. 1913.

Known in Guatemala only from the type, from Cuesta de Quililhá, near Purulhá, Baja Verapaz, *H. Pittier* 141. Honduras.

A shrub, branched from the base, the branchlets glabrous or nearly so; stipules subulate, 2-3 mm. long; leaflets 15-19, oblong, 9-13 mm. long, 5-7 mm. wide, glabrous except beneath on the costa, rounded at each end or retuse at the apex; racemes 4-6 cm. long; calyx glabrous except on the puberulent margin, 5 mm. long, the upper lip retuse, the lower minutely 3-dentate; corolla rose-purple, 10-12 mm. long; ovary stipitate, glabrous, about 6-ovulate; legume 6.5 cm. long, 1 cm. wide, long-attenuate to the base.

This is closely related to *G. Ehrenbergii* (Schlecht.) Rydb. of southern Mexico, and perhaps not distinct from that, which has been referred by Harms, with scant justification, to a distinct genus, *Hybosema*.

Gliricidia sepium (Jacq.) Steud. Nom. Bot. ed. 2. 1: 688. 1841. *Robinia sepium* Jacq. Enum. Pl. Carib. 28. 1760. *R. maculata* HBK. Nov. Gen. & Sp. 6: 393. 1824. *G. maculata* Steud. loc. cit. *G. maculata* var. *multijuga* Micheli in Donn. Smith, Bot. Gaz. 20: 284. 1895 (type from Santa Rosa, Heyde & Lux 3296). *Madre de cacao*; *Yaité* (Quiché, fide Tejada); *Cante* (Petén, fide Lundell); *Matasarna*; *Cansim* (Quechí).

Dry to wet hillsides and thickets or in forests of the plains, often in pastures or along roadsides, frequent in second growth or in fields or pastures, 1,600 meters or less; Petén; Alta Verapaz; Baja Verapaz; Izabal; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Suchitepéquez; Retalhuleu; San Marcos; Huehuetenango. Mexico; British Honduras to Salvador and Panama; West Indies; Colombia to the Guianas.

A tree, seldom more than 10 meters high, the crown spreading or pyramidal, the trunk 30 cm. or less in diameter, often branching from near the base, the bark light to rather dark brown, somewhat roughened by white protuberances, the branchlets puberulent when young, soon glabrate; stipules ovate to lanceolate, 2 mm. long; leaves deciduous, the leaflets 7-17, lance-oblong to ovate or elliptic, 3-7 cm. long, 2-3 cm. wide, acute or obtuse-acuminate, acute at the base, at first sparsely sericeous on both surfaces, glabrate in age, green above, faintly blotched beneath with pale purplish; racemes 5-10 cm. long, many-flowered and often dense, the bracts ovate, 1 mm. long, the pedicels 5 mm. long; calyx puberulent or almost glabrous, 4-5 mm. long; corolla 1.5-2 cm. long, bright rose-pink to almost white; legume 10-15 cm. long, 1-1.5 cm. wide, short-stipitate, glabrous, the valves thick and somewhat ligneous; seeds lenticular, dark brown, about 1 cm. long.

Sometimes called "madriado," "cacaguance," "madrial," "cacagua," and "madera negra" in Honduras; "cocoite," "cocoito" (Yucatan); "sayab," "sacyab," "sayuiab" (Yucatan, Maya). Sometimes called "cacahuananche" in Mexico, from a Nahuatl word meaning "cacao mother." This is one of the commonest and best-known trees of many parts of Central America, in general appearance much like the black locust (*Robinia Pseudacacia* L.) of the United States, to which it is closely related. It is abundant in many parts of Guatemala, particularly on the plains and foothills of the Pacific slope, but also extending well up into the mountains. When in flower during the dry season, and then leafless, the trees

are conspicuous, and the flowers sometimes are very beautiful and showy, especially if bright pink rather than whitish. The name "madre de cacao," like the old Aztec name, was given because the tree long has been planted as shade in cacao plantations, cacao trees thriving unusually well when associated with it, because of nitrogen-fixing bacteria that inhabit the roots of this tree. It is sometimes seen in Guatemala as shade in coffee plantations, as in the lower parts of Alta Verapaz, but it is not a good coffee shade, since it is leafless for much of the dry season. Branches placed in the ground take root quickly, and *Gliricidia* is much grown for living fence-posts. The wood is light to dark olive-brown, becoming russet upon exposure; very hard and heavy, strong, takes a high polish; is highly durable. Locally it is used for fence-posts, heavy construction, fuel, and railroad ties of the first quality. The leaves are eaten by cattle but, like other parts of the plant, they are poisonous to rats, mice, and other rodents, and to dogs. The ground bark or the leaves, mixed with cooked maize, are employed commonly in Central America for poisoning noxious animals. Poultices of the fresh crushed leaves are applied commonly to ulcers and tumors or to sores affected with gangrene, and as a remedy for *jíote* and other cutaneous diseases. It is a common practice to place the fresh leaves in hens' nests to remove parasites; these take refuge on the leaves, which are then removed and destroyed.

Glycine max (L.) Merrill, Interpret. Herb. Amboin. 274. 1917. *Phaseolus max* L. Sp. Pl. 725. 1753. *Dolichos Soja* L. op. cit. 727. *Soy bean*. This plant, so important in China and Japan, has been planted experimentally in Guatemala, but is little grown. At La Alameda near Chimaltenango the plants did not do well, but they may have thrived better elsewhere. In recent years this has become a highly important field crop of the United States, particularly in Illinois and Indiana, where hundreds of thousands of acres are devoted to it. In Asia the beans are one of the important food crops, but they are little used for food in the United States. Attempts have been made to popularize the toasted seeds as a substitute for peanuts, but such seeds have met with little favor. It would seem that they might find favor for this purpose in Guatemala, since they certainly are vastly superior to the *habas* that are roasted and eaten in such large amounts. The soy bean is grown in the United States principally for the oil and cake derived from its seeds.

HARPALYCE De Candolle

Unarmed trees or shrubs; leaves alternate, odd-pinnate, the stipules small; leaflets entire, with yellow or orange, sessile glands or gland-like scales beneath, petiolulate; flowers rather large, racemose, terminal or in the upper leaf axils, sometimes forming small leafy panicles, the bracts and bractlets small; calyx bilabiate, the upper 2 and lower 3 lobes wholly united to form 2 linear lips; petals purple, the standard short-unguiculate or sessile; wings oblanceolate-falcate, the keel petals lanceolate, falcate, united above the middle, the obtuse tips free; stamens monadelphous; alternate anthers longer; ovary sessile, several-many-ovulate, the style curved, the stigma terminal; legume sessile, narrow, 2-valvate, several-seeded, the seeds sometimes separated by spongy tissue.

About 15 species, in tropical America from Mexico and Cuba to Brazil. Seven species are recorded from Mexico.

Harpalyce rupicola Donn. Smith, Bot. Gaz. 13: 26. 1888.

Dry brushy rocky hillsides, 1,500–1,600 meters; endemic; Baja Verapaz (type from Santa Rosa, *Tuerckheim* 1210); Huehuetenango (Aguacatán).

A low shrub about 50 cm. high, perhaps attaining a greater height, the branchlets ferruginous-pubescent; leaves short-petiolate, the rachis ferruginous-pubescent; leaflets 11–15, almost sessile, subcoriaceous, oblong, rounded or retuse at the apex, rounded at the base, 2–2.5 cm. long, 1 cm. wide, puberulent or glabrate above, conspicuously yellow-glandular beneath; racemes or panicles 12–18-flowered, ferruginous-tomentose; calyx 1 cm. long, tomentose; petals purple, the standard 18 mm. long, 14 mm. wide, longer than the other petals; ovary 6–7-ovulate.

Only two collections are known, and the material obtained at Aguacatán is sterile. The shrub grows there on hot, open, very dry slopes of igneous rock where vegetation is very sparse.

INDIGOFERA L.

Herbs or shrubs; stipules subulate-setaceous, slightly adnate to the petioles; leaves odd-pinnate, rarely 3-foliate or 1-foliate; pubescence usually strigose, the hairs pale, stiff, affixed by the middle; flowers small, axillary, spicate or racemose, pinkish or purplish, the bracts usually caducous; calyx obliquely 5-dentate, the teeth subequal, or the lowest slightly longer; standard broad, sessile or short-unguiculate, strigose outside; wings slightly adherent to the keel; keel petals obliquely lanceolate, rounded to acute at the apex, rarely produced into a beak; stamens diadelphous, the vexillar stamen free, the others united more than half their length; ovary sessile, 1-many-ovulate, usually strigose, the style bent upward, glabrous, the stigma capitate; legume usually oblong or linear, sometimes globose, terete or somewhat 4-gonous, or compressed; seeds globose to cylindric, truncate at the ends, attached by the middle.

About 275 species, in both hemispheres, chiefly in warmer regions. About 50 are known from North America. One other Central

American species occurs in Costa Rica and one has been described from Panama.

Leaflets oblanceolate or narrowly obovate, broadest above the middle, 5 mm. wide or narrower; leaves sessile or nearly so; calyx lobes usually twice as long as the tube or longer.

Plants erect; leaflets mostly 1.5-3 cm. long *I. lespedezioides*.

Plants prostrate or procumbent; leaflets usually less than 1.5 cm. long, often much shorter..... *I. miniata*.

Leaflets oblong or oval, broadest at or below the middle; leaves petiolate.

Calyx often more than half as long as the corolla, the lobes subulate, more than twice as long as the tube..... *I. mucronata*.

Calyx much less than half as long as the corolla, the teeth lanceolate or deltoid, little or not at all exceeding the calyx tube.

Legume strongly curved, 1.5-2 cm. long..... *I. suffruticosa*.

Legume straight or nearly so, often much more than 2 cm. long, or, if somewhat curved, 1 cm. long or shorter.

Legume 1.5 cm. long or shorter, 2-4-seeded; leaflets 15-31.

Legume straight; racemes much shorter than the leaves. *I. guatemalensis*.

Legume somewhat curved; racemes about equaling the leaves.

Legume 2-3.5 cm. long, 6-12-seeded.

I. montana.

Leaflets commonly 21-27; legume gradually tapering into a long slender beak..... *I. Thibaudiana*.

Leaflets 9-15; legume abruptly contracted into a short beak. *I. tinctoria*.

Indigofera guatemalensis Moc., Sessé & Cerv. ex Prain & Baker, Journ. Bot. 40: 67. 1902 (based on material probably collected in Guatemala by Sessé and Mociño). *I. tinctoria* var. *brachycarpa* DC. Prodr: 2: 224, in part. 1825. *I. Micheliana* Rose, Contr. U. S. Nat. Herb. 8: 310. 1905 (type from Guatemala, the locality unknown, Heyde & Lux 198). *Jiquilite*.

Dry open banks or fields, sometimes on sandbars, 2,050 meters or less; Chiquimula; Jutiapa; Huehuetenango; doubtless also in other departments. Salvador; West Indies; Ecuador and Peru.

A slender shrub 1-2 meters high, the stems strigose; stipules subulate-setaceous, 2-4 mm. long; leaflets 15-21, oblong or lance-oblong, 1-2.5 cm. long, rounded to subacute and mucronate at the apex, acute at the base, strigose on both surfaces, paler beneath; racemes equaling or shorter than the leaves, dense and many-flowered; calyx 1.5 mm. long, strigose; corolla salmon-pink, the standard strigose with brown hairs; legume linear-oblong, strigose, 5-15 mm. long, 2-4-seeded, straight.

It is uncertain where this species is native. Formerly it was cultivated extensively in Salvador as a source of indigo, and probably also in Guatemala, as well as in the West Indies. In Central America it has not persisted like *I. suffruticosa*, and in Guatemala it is decidedly rare.

Indigofera lespedezioides HBK. Nov. Gen. & Sp. 6: 457. 1823. *Chipilín* (Jalapa, evidently an erroneous name belonging properly to *Crotalaria*); *Jiquilite*; *Cachicahua*; *Escorcionera de jiquelite*; *Barajera* (fide Aguilar).

Dry, rocky, brushy or grassy slopes, sometimes in savannas, occasionally on limestone, 200–1,600 meters; Petén; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Quiché; Huehuetenango. Southern Mexico; Honduras and Salvador to Panama; Greater Antilles; South America.

An erect perennial herb, a meter high or usually lower, from a thick hard root, the stems often very numerous, slender and wiry, simple or sparsely branched, angulate, strigose or glabrate; stipules lanceolate, 3–5 mm. long; leaves almost sessile, ascending, the rachis very short; leaflets 3–7, the lower leaves sometimes 1-foliate, narrowly oblanceolate, mostly 2–3 cm. long, acute to rounded at the apex, attenuate to the base, strigose, grayish; racemes few-flowered, dense, at first shorter than the leaves, in age sometimes longer; calyx 3 mm. long, strigose; corolla salmon-red, 6–7 mm. long, the standard densely sericeous outside; legume linear, 2–3 cm. long, 2 mm. thick, 8–10-seeded.

Called “guapito” in Salvador and “escorcionera” in Honduras. In the latter country a decoction of the root is sometimes used as a domestic remedy for diarrhea.

Indigofera miniata Ortega, Dec. 98. 1798. *Frijolillo* (fide Aguilar).

Dry, grassy or brushy, usually rocky slopes or plains, sometimes in oak forest, 200–1,900 meters; Zacapa; Chiquimula; Quiché; Huehuetenango. Southern Florida; Cuba; southern Texas southward through Mexico.

Perennial from a thick woody root, the stems usually numerous and branched, prostrate and often forming small dense mats, strigose, 50 cm. long or less; stipules subulate, 2 mm. long; leaves small, the rachis short; leaflets 5–9, oblong-ob lanceolate, 5–15 mm. long, acute to rounded at the apex, attenuate to the base, pale green, strigose; racemes dense or lax, shorter or slightly longer than the leaves, sometimes 5–8 cm. long but usually much shorter; calyx strigose, 4–5 mm. long; corolla salmon-red, 5–7 mm. long; legume linear, 1–2 cm. long, 2 mm. thick, 4–8-seeded, strigose, tapering to a short stout beak.

The plant is common in some places during the *invierno*, but soon withers after the beginning of the dry season.

Indigofera montana Rose, Contr. U. S. Nat. Herb. 8: 311. 1905.

At 2,000 meters; Huehuetenango (along road between Huehuetenango and San Sebastián H., *Steyermark* 50390). Central Mexico.

A shrub about a meter high, usually much branched, the branches slender, strigose; stipules subulate-setaceous, 2 mm. long; leaves numerous, spreading, 8–12 cm. long, the petiole and rachis densely strigose; leaflets 15–31, oblong, 1–2.5 cm. long, 5–10 mm. wide, obtuse or retuse and mucronate, subacute at the base, strigose on both surfaces or often quite glabrous on the upper surface; racemes equaling or even exceeding the leaves, rather densely many-flowered; calyx 1 mm. long, brown-strigose; corolla brick-red, 5 mm. long, the standard densely brown-strigose; legume narrowly oblong, slightly curved when mature, more strongly curved when young, abruptly acute, 6–9 mm. long, 2.5 mm. broad, subterete, sparsely strigose or glabrous; seeds 2–3, about 2 mm. long.

Indigofera mucronata Spreng. ex DC. Prodr. 2: 227. 1825.
Frijolillo; Frijolillo de llano; Mozotillo.

Moist thickets or hedgerows, often in waste ground or cultivated soil, 1,500 meters or lower; Alta Verapaz; Izabal; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Chimaltenango; Quiché; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos. Southern Mexico; British Honduras to Salvador and Panama; West Indies; northern South America.

Plants perennial, herbaceous, usually decumbent, sometimes procumbent or reclining on low shrubs, the stems slender, branched, usually a meter long or often much shorter, angulate, strigose; stipules subulate-setaceous; leaflets usually 5, sometimes 7, thin, sparsely strigose, green above, pale beneath, oval or elliptic, 1–4 cm. long, mucronate, rounded at each end; racemes lax, often greatly elongate, mostly longer than the leaves, in fruit sometimes 20 cm. long; calyx 3 mm. long, strigose; corolla salmon-red or brick-red, 6 mm. long; legume reflexed, linear, straight, 2.5–4 cm. long, less than 2 mm. thick, strigose, many-seeded.

Called “añilillo” in Yucatan and Tabasco. A common weedy plant of the lowlands of Central America.

Indigofera suffruticosa Mill. Gard. Dict. ed. 8. no. 2. 1768.
I. Anil L. Mant. Pl. 272. 1771. *I. Guatemala* Lunan, Hort. Jam. 420. 1814. *Jiquelite; Añil; Tinto; Platanito; Tinaco; Añil de piedra* (Petén); *Platanito de tinto; Barbasco* (Huehuetenango); *Sacatinta; Platanillo.*

Dry to wet fields and thickets, often in waste ground, sometimes on exposed hillsides or on sandbars, sometimes a weed in cultivated ground, 1,500 meters or less, most common at low elevations; Petén; Alta Verapaz; El Progreso; Izabal; Zacapa; Chiquimula; Jalapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Suchitepéquez; Sololá; Quiché; Huehuetenango; San Marcos. Southeastern United States; Mexico; British Honduras to Salvador and Panama; West Indies; South America; naturalized in the Old World tropics.

Plants herbaceous or usually suffrutescent, stiffly erect, 1.5 meters high or less, sparsely branched, the stems angulate, strigose; stipules subulate-setaceous, 3 mm. long; leaflets 9-15, elliptic to oval, usually obtuse or rounded at the apex and mucronate, grayish, sparsely or densely strigose, acute or obtuse at the base; racemes dense, 2-5 cm. long, much shorter than the leaves; calyx densely strigose, 1.5 mm. long; corolla salmon-red, 5-6 mm. long, the standard densely strigose outside; legumes stout, usually very numerous and densely crowded, 1.5-2 cm. long, strongly curved, 2 mm. thick, 3-7-seeded, brownish, at least when dry, strigose.

The Maya name of Yucatan is "choh." The name "jiquelite" is of Nahuatl derivation, signifying "turquoise herb." The plant has been grown since immemorial times in Mexico and Central America as a source of indigo dye. Indigo is and has been obtained from various species of *Indigofera*, but this is the one most exploited in Central America, although *I. guatemalensis* also was cultivated at times for the purpose. Before the introduction of coffee, indigo was one of the most important exports of Central America, but it is now grown commercially only in northern Salvador. It is shipped in the form of large balls, encased in cowhide. Indigo dye and the indigo used for whitening clothing when being laundered is now made synthetically, like so many other dyes formerly obtained as natural plant products. It is perhaps just as well for Central America that its cultivation has been abandoned, since preparation of the dye was injurious to the health of persons employed in the industry. The freshly cut plants were immersed in large vats lined with bricks, such as may sometimes be discovered even now about Central American *fincas*. After fermentation had proceeded for some time, the plants were trampled by men in the tanks, after which the dye settled to the bottom of the water and was formed into small cakes that were later dried. Indigo was formerly much planted in some parts of Guatemala, especially in the Oriente and along the Pacific foothills and plains, and some is grown even today, for dyeing native textiles. The indigo-colored coats and trousers forming the costumes of the men of certain highland towns are most distinctive. As late as 1883 it was reported that 135 *quintales* (hundredweight) of indigo were exported from Guatemala. The plant finds some use in domestic medicine in Guatemala. It may be noted that as far away as the United States indigo often is applied to stings of bees and other insects to reduce pain and inflammation, although its efficacy is somewhat doubtful. Wild plants of *Indigofera suffruticosa* are only occasional in the central uplands, and seldom abundant anywhere in Guatemala.

Indigofera Thibaudiana DC. Prodr. 2: 225. 1825. *I. excelsa* Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 45. 1843. *Pinaco*; *Barbasco hembra* (Huehuetenango); *Chapa silvestre*.

Brushy slopes or fields, sometimes in open forest, 200–2,200 meters; Zacapa; Guatemala; Sacatepéquez; Chimaltenango; Huehuetenango. Southern Mexico.

A slender shrub 1.5–2.5 meters high, simple or sparsely branched, the stems somewhat angulate, strigose; stipules setaceous, 5 mm. long; leaves large, the leaflets 21–27, oblong or oblong-oval, 2–4 cm. long, obtuse or rounded at the apex and mucronate, green above and sparsely strigose, pale beneath and strigose; racemes dense, many-flowered, equaling or shorter than the leaves, in fruit sometimes longer; calyx 2 mm. long, brown-strigose; corolla salmon-red, 8–9 mm. long, the standard brown-strigose outside; legume linear-cylindric, 2–3 cm. long, 2 mm. thick, 6–8-seeded, sparsely strigose, narrowed to a slender elongate beak; seeds subterete, 2 mm. long, pale brown.

Although represented by numerous Guatemalan collections, this plant is of only sporadic occurrence, and seldom plentiful in any locality. It is said to be used sometimes as a dye plant. An infusion of the leaves or roots is used by the Indians of Huehuetenango for bathing domestic animals, to kill or drive away mites and insects infesting them.

Indigofera tinctoria L. Sp. Pl. 751. 1753.

British Honduras (Jones Lagoon, Sibun River, *P. H. Gentle* 1748). Native of southern India; formerly cultivated in some parts of tropical America as a source of indigo, and naturalized in the West Indies and elsewhere; in British Honduras perhaps a casual introduction, or a relic of former cultivation.

A slender shrub 1–2 meters high, the stems terete or subangulate, strigose; stipules subulate-setaceous, 2–3 mm. long; leaflets 9–15, petiolulate, oval, rounded and mucronate at the apex, thin, obtuse or acute at the base, 1–2.5 cm. long, usually glabrous above, strigose beneath; racemes 3–7 cm. long, mostly shorter than the leaves; calyx 1.5 mm. long, strigose; corolla salmon-red, 5–6 mm. long; legume linear-cylindric, 3–3.5 cm. long, 2 mm. thick, straight or slightly curved, 8–12-seeded, contracted into a short beak; seeds 2 mm. long.

LATHYRUS L.

Herbs, usually scandent by tendrils; leaves pinnate, the rachis usually terminated by a tendril, the leaflets few, entire; stipules commonly foliaceous and semisagittate; flowers mostly large and showy, purple, pink, or white, the peduncles axillary and elongate, the flowers solitary or racemose; bracts caducous; bractlets none; calyx usually oblique at the base or gibbous, the teeth subequal or the upper ones shorter; standard broad, emarginate, short-unguiculate; wings falcate-obovate

or oblong, somewhat adherent to the keel at the middle or almost free; keel shorter than the wings, incurved, obtuse; vexillar stamen free or connate with the others, the anthers uniform; ovary subsessile or stipitate, usually with numerous ovules; style inflexed, barbate along the inner side, the stigma terminal; legume compressed or subterete, 2-valvate, continuous within; seeds usually numerous, globose or rarely compressed; cotyledons thick, the radicle inflexed.

Species perhaps 100, mostly in temperate regions. None are native in Central America, but a few are found in Mexico.

Plants perennial; stems glabrous; peduncles often with more than 4 flowers.

L. latifolius.

Plants annual; stems pilose; peduncles 2-4-flowered. *L. odoratus*.

***Lathyrus latifolius* L. Sp. Pl. 733. 1753. *Chorrequé*.**

Native of Europe, but cultivated for ornament in many temperate and warm regions; common in Guatemala.

A coarse perennial vine, glabrous throughout or nearly so, the stems striate, broadly winged; stipules large, semihastate, often 2.5 cm. long; petioles equaling the stipules or longer, winged, the rachis greatly prolonged beyond the leaflets and terminating in a branched tendril; leaflets 1 pair, oblong-lanceolate to elliptic, conspicuously veined, 2.5-7 cm. long, acute to rounded at the apex and mucronate; peduncles longer than the leaves; flowers usually red-purple, 2.5 cm. long; legume compressed, about 6 cm. long and 7-8 mm. wide, acute, rostrate.

This perennial pea is little grown in the United States for ornament, but it is popular through much of Guatemala, and especially in the highlands of the Occidente. In the central region it is often seen filling long hedges. It has escaped from cultivation and become more or less naturalized in parts of Quezaltenango, as about Almolonga and Zunil, and also in San Marcos. A few years ago the enterprising *jefe político* of San Marcos had this *Lathyrus* and geraniums (*Pelargonium*) planted all along the sides of the Carretera Internacional through a considerable part of his department. The geraniums have thrived only moderately well in the road itself, although there is a great abundance of them in the bordering hedges and dooryards, but the *Lathyrus* has succeeded much better than might have been expected, and apparently becomes more plentiful each year, in spite of the long dry season and the unfavorable soil of the region. In many places along this road the plants form large and dense tangles, with a multitude of blossoms.

***Lathyrus odoratus* L. Sp. Pl. 732. 1753. *Chorrequé*. Sweet pea.**

Said to be native in Italy, but now grown for ornament in most civilized parts of the earth; very common in gardens of Guatemala.

Plants annual, scandent, the stems striate, narrowly winged, rough-hairy; stipules semisagittate; leaves long-petiolate, the rachis elongate beyond the leaflets and ending in a branched tendril; leaflets 1 pair, oblong to oval or ovate, pale green, acute or obtuse, pilose beneath on the conspicuous nerves; peduncles longer than the leaves, the flowers exceedingly varied in color, fragrant, white to shades of red, blue, and yellow; legume 2.5–5 cm. long.

The sweet pea shows itself highly adaptable to climate, and in Guatemala thrives from the highest settlements down to the coasts. It is often planted in the parks, and during 1941 handsome displays were noted at Huehuetenango and San Martín Chile Verde, as well as at Cobán. Great quantities of the flowers are sold in the larger markets, especially in Guatemala City. There are large plantations of them for market about San Juan Sacatepéquez, where so many other flowers are grown on a large scale to supply the Guatemala market.

LENNEA Klotzsch

Unarmed trees or shrubs; stipules subulate or setaceous, deciduous; leaves odd-pinnate, the leaflets entire, stipellate; flowers small, in axillary racemes, the bracts subulate or setaceous; calyx campanulate, with 5 short teeth; petals subequal, the standard reflexed, orbicular, short-unguiculate; wings obliquely oblong, auriculate at the base; keel petals lunate, obtuse, united above, with a rounded basal auricle; stamens 10, monadelphous, the anthers uniform; ovary short-stipitate, many-ovulate, the style pubescent along the inner side, spirally curved toward the apex, the stigma terminal; legume linear, short-stipitate, many-seeded, continuous within; seeds lenticular.

Three species are known besides the following, one in Salvador, one in Mexico, and one in Panama. *L. salvadorensis* Standl., known in Salvador as "polvo de queso," is to be expected in the lowlands of Jutiapa and Santa Rosa.

Leaflets rounded or retuse at the apex; racemes elongate, very lax and remotely flowered *L. melanocarpa*.
 Leaflets rather abruptly acuminate; racemes short, dense, scarcely longer than the petioles *L. modesta*.

Lennea melanocarpa (Schlecht.) Vatke ex Harms, Repert. Sp. Nov. 19: 68. 1923. *Robinia melanocarpa* Schlecht. Linnaea 12: 305. 1838. *L. robinioides* Klotzsch in Link, Klotzsch & Otto, Icon. Pl. Hort. Berol. 2: 65. 1842.

Upland forest or sandy stream beds, 300 meters or less; Petén. British Honduras; San Luis Potosí and Veracruz.

A slender shrub or small tree, commonly 2–3 meters high, the branchlets slender, glabrous; stipules 1–2 mm. long; leaflets 9–13, elliptic to oblong, 2.5–6.5

cm. long, rounded or shallowly emarginate at the apex, rounded to broadly cuneate at the base, short-petiolulate, thin, glabrous; racemes solitary or geminate, slender, lax, few-flowered, the pedicels 2-3 mm. long; calyx 2 mm. long, tomentose on the margins of the teeth, otherwise glabrous; corolla red-purple, 1 cm. long; legume 5-7 cm. long, 12 mm. wide, 3-4-seeded, narrowed to a short stipe, glabrous.

Lennea modesta Standl. & Steyermark, comb. nov. *Lonchocarpus modestus* Standl. & Steyermark. Field Mus. Bot. 23: 56. 1944.

Moist or wet, mixed, lowland forest, 350 meters or less; endemic; Alta Verapaz (near Cubilgüitz); Izabal (type collected along the shore between Santo Tomás and Escoba, *Steyermark* 39238).

A shrub or a small tree as much as 8 meters high, the rather slender branches ferruginous, ferruginous-strigillose when young; leaflets 3-5, on petiolules 3-5 mm. long, firm-membranaceous or chartaceous, elliptic-oblong or ovate-oblong, 5-12 cm. long, 2.5-5 cm. wide, rather abruptly acuminate, rounded to subacute at the base, glabrous on both surfaces, the veins rather prominent beneath and closely reticulate; racemes axillary, small and densely few-flowered, about 2.5 cm. long, the rachis ferruginous-puberulent, the pedicels 3 mm. long or less; bracts linear-filiform; calyx campanulate, 3.5-4 mm. long, almost glabrous but with a few minute glistening hairs, punctate, ciliate, acute at the base, the teeth narrow, almost as long as the tube; petals deep rose-red, glabrous, punctate, the broad standard 8 mm. long; ovary subsessile, linear, appressed-pilose; legume somewhat compressed, glabrous, about 7.5 cm. long, 14 mm. wide, obliquely acute at the apex, attenuate to the base, somewhat elastically dehiscent, the valves thick, convex, not septate within; seeds about 3, rounded oval, 10 mm. long and 8 mm. broad, slightly compressed, castaneous.

The type specimen was in flower and its generic position uncertain, as so often happens in the case of Leguminosae belonging to Galegeae and Dalbergieae when fruit is not available. A recent collection with fruit shows that the tree must be referred to the Galegeae rather than to *Lonchocarpus*. It may be placed satisfactorily in *Lennea*, especially since it has the coiled style characteristic of that genus. It and *L. salvadorensis* are probably related, and both differ from *L. melanocarpa* conspicuously in leaf texture and general appearance.

Lens culinaris Medic. (*Ervum Lens* L.; *L. esculenta* Moench), the lentil (Spanish "lenteja"), native of Europe, is cultivated frequently in Guatemala for its seeds, although not on a large scale. It is a low annual, the leaves ending in a tendril and having numerous, oval or oblong-oval, glabrate, entire leaflets; flowers small, white or pale blue, geminate at the end of a long slender peduncle; legume short and broad, flat, containing 2 small compressed seeds. Lentils are used rather commonly for food in some parts of Guatemala but they are not an important article of diet.

LONCHOCARPUS HBK.

Reference: Henry Pittier, The Middle-American species of *Lonchocarpus*, Contr. U. S. Nat. Herb. 20: 37-93. pls. 1-6. 1917.

Trees or shrubs; leaves alternate, odd-pinnate, rarely 1-3-foliolate, the leaflets opposite, mostly estipellate; flowers rather large, violaceous, purple, whitish, or red-purple, in simple or rarely paniculate racemes; pedicels fasciculate along the rachis or geminate, the bracts small, caducous, the bractlets caducous or persistent; calyx truncate, the teeth very short or obsolete; standard orbicular to obovate, 2-appendiculate at the base or naked; wings oblique-oblong or falcate, slightly adherent to the keel; keel arcuate or almost straight, obtuse; vexillar stamen free at the base, connate at the middle with the others to form a closed tube, the anthers versatile; ovary stipitate, 2-many-ovulate, the style incurved, filiform, the stigma small, terminal; legume oblong or suborbicular to elongate, flat, membranaceous or coriaceous, indehiscent, the sutures not winged but the upper one often dilated or thickened; seeds 1-2 or rarely numerous, compressed, reniform or orbicular, the radicle inflexed.

Probably more than 100 species, in the tropics of America, Africa, and Australia. Others are found in southern Central America. Some of the South American species have become of importance in recent years as a source of the drug rotenone, used as an insecticide. It is possible that the same properties may exist in some of the Central American species, but no extensive studies of them have been carried out.

Leaflets only 3.....*L. phaseolifolius*.

Leaflets more than 3 in all or most of the leaves, usually much more numerous.

Costa and nerves impressed on the upper surface of the leaflet, very prominent beneath; leaflets usually densely sericeous, tomentose, or pilose beneath, rounded or very obtuse at the apex.

Leaflets 5; legume 1-seeded.....*L. phlebophyllus*.

Leaflets more than 5; legumes mostly, or many of them, 2-seeded. *L. rugosus*.

Costa and nerves not impressed on the upper surface of the leaflet, not very prominent beneath; leaflets often glabrous or glabrate, often acute or acuminate.

Flowers small, 8 mm. long or shorter; leaflets small, mostly 2-5 cm. long; legume about 1 cm. wide, glabrous.

Standard glabrous or nearly so.....*L. atropurpureus*.

Standard densely sericeous outside.....*L. minimiflorus*.

Flowers mostly more than 1 cm. long; leaflets mostly 6-8 cm. long or larger; legume commonly much more than 1 cm. wide, often or usually pubescent.

Leaflets narrowly oblong or lance-oblong, 1.5 cm. wide or narrower, the margin strongly revolute, minutely sericeous beneath; legume strigillose, 2-2.5 cm. wide, both margins narrowly winged.....*L. Castilloi*.

Leaflets broadly oblong to elliptic or ovate, usually much more than 1.5 cm. wide, the margins not revolute.

Standard glabrous.

Leaflets small, mostly 1 cm. wide.....*L. Salvinii*.

Leaflets larger, 1.5-2 cm. wide or more.....*L. amarus*.

Standard sparsely or often very densely sericeous.

Upper (vexillar) margin of the legume thin, sharp-edged, not thickened above the seeds.

Leaflets closely and conspicuously reticulate-veined beneath, densely pubescent with short spreading hairs. *L. purpureus*.

Leaflets not conspicuously reticulate-veined, the pubescence mostly appressed.

Leaflets usually 5. *L. lineatus*.

Leaflets more than 5 in all or most of the leaves.

Standard coarsely punctate or dotted, almost glabrous.

. *L. Michelianus*.

Standard not punctate, densely sericeous. *L. latifolius*.

Upper margin of the legume thickened above the seeds, somewhat broadened and carinate or concave.

Legume densely velutinous-pubescent. *L. salvadorensis*.

Legume glabrate or minutely puberulent or sericeous.

Flowers small, the standard about 6 mm long; leaflets pale beneath, densely strigillose. *L. santarosanus*.

Flowers larger, the standard usually 1 cm. long; leaflets not pale beneath, glabrate, at least in age.

Calyx fully as high as broad, its pubescence dark brownish; legume scarcely 1.5 cm. wide, the upper margin very narrow. *L. hondurensis*.

Calyx usually broader than high, at least at the end of anthesis, its pubescence gray or whitish; legume 2 cm. wide, the upper margin much broadened. *L. guatemalensis*.

Lonchocarpus amarus Standl. Carnegie Inst. Wash. Publ. 461: 63. 1935.

Type from Río Grande, British Honduras, *W. A. Schipp* 1120, growing in forest.

A tree of 24 meters, the trunk 60 cm. in diameter, the young branchlets sparsely and minutely sericeous, soon glabrate; leaflets 11-13, petiolulate, oblong or elliptic-oblong, about 35 mm. long and 15-18 mm. wide, rounded or very obtuse at the apex, often excised, rounded or obtuse at the base, glabrous above, rather densely sericeous beneath, at least when young, with minute lustrous fulvescent hairs; flowers purple, racemose, the racemes 13 cm. long or less, lax, many-flowered, forming large panicles, the branches sericeous, the pedicels 3-5 mm. long; calyx narrowly campanulate, 6-7 mm. long, acute or attenuate at the base, densely sericeous with minute, brown or blackish hairs; standard glabrous, 1.5 cm. long; ovary linear, densely sericeous.

The local name is "bitterwood."

Lonchocarpus atropurpureus Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 91. 1860.

Dry, often rocky plains and hillsides, 150-1,000 meters; Zacapa; Chiquimula; El Progreso. Southern Mexico; Honduras; Costa Rica; Venezuela; Ecuador.

A shrub or a tree of 5-12 meters with spreading crown, the branchlets at first puberulent or short-pilose; leaves small, the leaflets 5-9, short-petiolulate, oblong-ovate to oblong-elliptic or lance-oblong, mostly 2-6 cm. long, obtuse-acuminate, cuneate at the base, rather thick, glabrate above, paler beneath, puberulent or sericeous with short grayish hairs; flowers dark purple, in small slender lax axillary racemes, these mostly much shorter than the leaves, pubescent, the pedicels 1-2 mm. long; bracts and bractlets oblong; calyx broadly campanulate, 2 mm. long, minutely pubescent; standard about 9 mm. long, almost glabrous; legume strongly compressed and flat, thin, 4-10 cm. long, 1 cm. wide, rounded at the apex, cuneate at the base and long-stipitate, glabrous or nearly so, both margins thin.

Called "chaperno" in Honduras.

Lonchocarpus Castilloi Standl. Trop. Woods 32: 15. 1932.

Wet thickets or forest, at or little above sea level; Petén; Izabal; Alta Verapaz; Quiché. British Honduras (type from Freshwater Creek Reserve, A. Castillo 30); Tabasco.

A small to large tree, sometimes 30-35 meters high with a trunk a meter in diameter, the branchlets almost glabrous; leaflets about 15, coriaceous, petiolulate, narrowly oblong or lance-oblong, mostly 3-5 cm. long and 7-12 mm. wide, often somewhat larger on sterile branches, obtuse or often attenuate to the apex, cuneate-acute or obtuse at the base, glabrous above, pale beneath and densely and minutely strigillose, the margins strongly revolute; flowers bright purple, 1 cm. long, in many-flowered axillary racemes, the rachis minutely sericeous, the pedicels 2-4 mm. long; calyx 4 mm. broad, broader than long, minutely brownish-sericeous; standard densely sericeous outside; legume 7-10 cm. long, 2-3 cm. wide, very minutely sericeous or glabrate, thin, attenuate to the base, both margins thin and acute, 1-2-seeded.

Known in Honduras as "cabbage-bark," "black cabbage-bark," and "machich" (Maya). The species differs from all others known from Mexico and Central America in its narrow, strongly revolute-margined leaflets.

Lonchocarpus guatemalensis Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 87. 1860 (type collected by Friedrichsthal in Guatemala, the locality not indicated). *L. Xuul* Lundell, Bull. Torrey Club 69: 391. 1942 (type from Yucatan). *Palo de gusano* (Petén); *Yaxmajin*, *Ixec-subin*, *Habin* (Petén, Maya, fide Lundell); *Sibicté* (Alta Verapaz).

Moist or wet forest or brushy hillsides, 350 meters or less; Petén; Alta Verapaz; Izabal. Southern Mexico; British Honduras to Salvador and Costa Rica.

A small to rather large tree, sometimes 12 meters high or more, the trunk as much as 75 cm. in diameter, the branchlets glabrous or nearly so; leaflets 5-7, subcoriaceous, often sparsely pellucid-punctate, mostly 4-7 cm. long, ovate-

oblong or obovate, shortly obtuse-acuminate, obtuse or broadly cuneate at the base, glabrous or nearly so, at least in age, slightly paler beneath; racemes axillary, often on old wood, solitary or fasciculate, usually many-flowered, the rachis grayish-sericeous, the flowers appearing with or before the new leaves, pale purple; pedicels 4 mm. long or less, the bracts and bractlets ovate, acute; calyx cupular, 4.5–5 mm. long and somewhat wider, grayish-sericeous; petals often yellow-dotted, the standard 12–14 mm. long, sericeous outside; ovary about 7-ovulate, densely grayish-pilose; legume long-stipitate, 1–3-seeded, 7 cm. long or shorter, 1.5–2 cm. wide, acute at each end, glabrous or nearly so, the lower margin thin and acute, the upper margin broadly dilated and deeply sulcate between the 2 wing-like valve margins.

Called "dogwood" and "turtle-bone" in British Honduras; "chapel" (Honduras); "chapelno hediondo," "cincho," "chaperno prieto" (Salvador); "yax-habim," "xuul" (Yucatan, Maya). This species has been reported from Guatemala as *L. sericeus* HBK. It is possible that *L. Xuul*, based in part on material from British Honduras, is a distinct species, but there is no good reason for believing so. The wood in the various Central American species of *Lonchocarpus* is rather highly colored, hard, heavy, tough, and strong. It is used to some extent locally for heavy and durable construction.

A related species, *Lonchocarpus longistylus* Pittier, of Yucatan, is known by the Maya name "balché." By the ancient Mayas the bark was soaked in water with honey and fermented to produce an intoxicating beverage called "balché." With this they were accustomed to intoxicate themselves at religious and other celebrations, and it was also offered ceremonially to their gods. The drink is still made and used in the Maya region, but sugar sirup generally is employed in place of honey, its Spanish name being *pitarrilla*. It is probable that *L. longistylus* extends into Petén and that more than one of the closely related *Lonchocarpus* species is utilized for preparing the beverage. Tozzer states that *balché* is much used in the religious ceremonies of the Lacandón Indians of Petén. He describes the prepared beverage as milky white, with a sour odor, and at first disagreeable to the taste. It contains only a small per cent of alcohol, but drunkenness is attained by drinking large quantities of it.

Lonchocarpus hondurensis Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 91. 1860. *Chaperno* (name reported from North Coast); *Ixtzente*, *Ciicche* (Petén, Maya, fide Lundell); *Gusano* (Petén).

Along stream banks and in swampy forest, 400 meters or less; Petén; Alta Verapaz; reported from Izabal, and certainly to be expected there. Southern Mexico; British Honduras; Honduras.

Commonly a tree of 6-8 meters but sometimes 15 meters high and with a trunk 60-90 cm. in diameter, often with small buttresses, the bark light to dark brown, the inner bark exuding a blood-red sap, the crown dense, spreading or rounded; branchlets glabrous or nearly so; leaflets usually 5, coriaceous, on petiolules 3-5 mm. long, ovate-oblong to elliptic, mostly 4-10 cm. long, obtuse or usually shortly obtuse-acuminate, glabrous or nearly so, green on both surfaces; racemes borne in the upper leaf axils and forming long panicles at the ends of the branches, the stout rachis almost glabrous, the pedicels stout, very short; calyx campanulate, 3.5 mm. long, covered with a dense pubescence of short, dark brown or blackish, glistening, appressed hairs; petals deep red-purple, the standard about 1 cm. long, densely sericeous outside; ovary stipitate, pubescent, 5-9-ovulate; legume usually 1-2-seeded, strongly compressed and thin, dark reddish, 6 cm. long or shorter, 15-18 mm. wide, almost glabrous, often deeply constricted between the seeds, rounded and apiculate at the apex, abruptly contracted at the base into a short or long stipe, both margins slightly thickened, the upper one more so and channeled.

Known in British Honduras as "waterside turtle-bone," "swamp dogwood," and "cabbage-bark"; "chaperno" (Honduras); "gusano" (Tabasco); "rosa morada" (Veracruz). The tree is a showy and handsome one when in flower. The wood is said to be creamy yellow and slightly fragrant.

Lonchocarpus latifolius (Willd.) HBK. Nov. Gen. & Sp. 6: 383. 1824. *Amerimnum latifolium* Willd. Sp. Pl. 3: 909. 1801. (?) *L. izabalanus* Blake, Contr. U. S. Nat. Herb. 24: 7. 1922 (type from Lago de Izabal, Izabal, Blake 7841; local name *Almendro*). *Mataboy* (Huehuetenango).

Wet forest or along streams, 1,200 meters or less; Izabal; Huehuetenango. Tabasco; British Honduras; Honduras; Costa Rica; Panama; West Indies.

A medium-sized or large tree, sometimes 15 meters high with a trunk 25 cm. or more in diameter, the branchlets brown-sericeous; leaves large, the leaflets 5-9, rather thin, ovate to ovate-oblong or elliptic-oblong, mostly 7-12 cm. long, acuminate to subobtuse, acute to rounded at the base, green above and almost glabrous, pale beneath and densely covered with minute, closely appressed, grayish hairs; racemes brownish-sericeous or puberulent, numerous in the leaf axils near the ends of the branches, often dense and many-flowered, the pedicels 3 mm. long or shorter, the bractlets minute, linear; calyx broadly campanulate, 3 mm. long, densely and minutely sericeous; petals dark red-purple or greenish purple, the standard 10-15 mm. long, sericeous outside; ovary pubescent, 2-5-ovulate; legume strongly compressed and thin, brown, minutely sericeous or finally glabrate, usually 1-3-seeded, 4-6.5 cm. long, 1.8-2.5 cm. wide, rounded to acute at the apex, rounded to acute at the base, almost sessile, the margins thin and acute; seeds thin, reniform, about 11 mm. long and 6 mm. broad.

Known in British Honduras as "dogwood," "swamp dogwood," and "waterwood"; "cincho" (Honduras). Schipp states that in

British Honduras the tree is usually inhabited by a particular species of ant that excavates tubes in the young branchlets.

Lonchocarpus lineatus Pittier, Contr. U. S. Nat. Herb. 20: 66. f. 15. 1917. *Chaperno*.

Wet forest, 350 meters or less; Alta Verapaz (type from Cubilgüitz, *Tuerckheim* 7853); Izabal. Tabasco; Campeche; British Honduras.

A tree of 7-13 meters, the branchlets brown-sericeous at first; leaflets commonly 5, on petiolules 4-6 mm. long, rather thin, ovate or elliptic-oblong, acute or acuminate, rounded or obtuse at the base, 4-12 cm. long, green and glabrate above, very pale beneath and pubescent with short, appressed or somewhat spreading, often lustrous hairs; racemes brownish-pubescent, slender and elongate, numerous at or near the ends of the branches, many-flowered, the pedicels 2-3 mm. long; bracts and bractlets very small, ovate; calyx campanulate, 2.5-3 mm. long, minutely sericeous with brownish lustrous hairs; petals pink or purple, the standard 1 cm. long, sparsely or densely sericeous outside; ovary pubescent, about 8-ovulate; legume 1-2-seeded, 2-5 cm. long, 15-18 mm. wide, rounded to acute at the apex and long-rostrate, rounded or acute at the base, short-stipitate or almost sessile, rather densely and minutely sericeous or finally glabrate, the margins very thin, acute.

• Called "waterwood" in British Honduras.

Lonchocarpus Michelianus Pittier, Contr. U. S. Nat. Herb. 20: 61. f. 9. 1917.

Known in Guatemala only from the type, *Heyde & Lux* 4468, from El Naranjo, Santa Rosa, 1,200 meters. Honduras.

Young branchlets pubescent; leaflets 7-9, on petiolules 5-6 mm. long, ovate or ovate-elliptic, 4-7 cm. long, acuminate, obtuse at the base, minutely pellucid-punctate, green and glabrate above, pale beneath, pilose with subappressed whitish hairs; racemes axillary, rather lax and few-flowered, the rachis puberulent, the pedicels 6-7 mm. long; bracts and bractlets very small, oblong; calyx broadly campanulate, 4.5 mm. long, grayish-sericeous; petals purple, dotted, the standard about 15 mm. long, thinly sericeous outside; ovary sessile, velutinous-pubescent, 3-4-ovulate; legume unknown.

This has been reported from Guatemala as *L. violaceus* HBK. In Honduras it is called "cincho."

Lonchocarpus minimiflorus Donn. Smith, Bot. Gaz. 44: 110. 1907. *Chaperno*.

Dry brushy plains and hillsides, often in rocky places, 150-850 meters; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Guatemala; Sololá (type from Santa Bárbara, *Heyde & Lux* 6330); Quiché. Southern Mexico; Salvador to Costa Rica.

A small tree of 10 meters or less, with spreading crown, often flowering when only a shrub, the branchlets grayish-pubescent at first; leaves small, the leaflets 7-13, rather thin, on petiolules 3-5 mm. long, ovate to elliptic-lanceolate, mostly 2-5 cm. long, acute or obtuse, obtuse or cuneate at the base, green and sparsely strigillose above or glabrate, paler beneath, more densely strigillose; racemes axillary, usually much shorter than the leaves, the rachis pubescent, the flowers sparse or dense, usually numerous, deep lilac or sometimes white, the pedicels short; calyx campanulate, 2 mm. long, sericeous; standard 5-6 mm. long, sericeous outside; ovary pubescent, 4-6-ovulate.

Known in Salvador by the names "chapelno," "chaperno," "chapuno," and "chapelno negro." The wood is used for fuel, charcoal, and fence-posts. It is valued for fuel because it burns for a long time. The young shoots are eaten by stock.

Lonchocarpus phaseolifolius Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 93. 1860. *L. trifoliolatus* Standl. Journ. Wash. Acad. Sci. 15: 475. 1925 (type from Dept. Chalatenango, Salvador).

Moist or dry thickets on the plains, sometimes in rocky *quebradas* or on brushy rocky hillsides, 700 meters or less; Zacapa; Santa Rosa; Retalhuleu. Oaxaca, the type from Tehuantepec; Salvador; Honduras; Nicaragua.

A shrub or small tree, the branchlets densely pilose with short spreading hairs; leaves petiolate, 3-foliolate, the leaflets thin, broadly ovate to rounded-ovate or almost orbicular, 6-20 cm. long, 5-15 cm. wide, acute or abruptly short-acuminate, rounded or subcordate at the base, densely velutinous-pilose with short hairs, especially beneath, sometimes glabrate in age, the lateral leaflets usually much smaller than the terminal one; racemes axillary, solitary, little exceeding the petioles, many-flowered, dense or open, the bracts and bractlets very small and broad, obtuse; calyx campanulate, 3 mm. long, minutely sericeous; petals dark and light purple, the standard 8 mm. long, densely sericeous outside; legume 1-3-seeded, 4-6.5 cm. long, 2-2.5 cm. wide, rounded or truncate at the apex, acute and stipitate at the base, glabrous or nearly so, somewhat glaucous, the margins thin, acute, the valves thin.

Of authentic material of *L. phaseolifolius* we have seen only a photograph of a specimen of the type collection, and we have seen no Mexican specimens. It appears certain, however, that this and *L. trifoliolatus* are conspecific, and the range of the combined species is, of course, a most natural one. The plant is highly variable in shape and pubescence of the leaflets, but not unreasonably so. It is easy of recognition because of its uniformly 3, very large and broad leaflets.

Lonchocarpus phlebophyllus Standl. & Steyererm. Field Mus. Bot. 23: 56. 1944.

Brushy rocky dry hillsides, 400–660 meters; Chiquimula (type collected between Ramírez and Cumbre de Chiquimula, on the road between Chiquimula and Zacapa, *Standley* 74569); doubtless also in Zacapa.

A small tree, the branchlets densely puberulent; leaves long-petiolate, the leaflets 5, on petiolules 2–4 mm. long, oblong to oval-oblong, coriaceous, 3.5–8 cm. long, 1.8–3.5 cm. wide, rounded at the apex and usually subemarginate, obtuse or rounded at the base, grayish green above, puberulent, the costa and nerves conspicuously impressed, densely pilose beneath with short spreading hairs, the lateral nerves numerous, strongly elevated and very conspicuous, the veins prominent and closely reticulate; flowers apparently in elongate racemes as long as the leaves or longer; legume 1-seeded, elliptic-oblong or oblong-obovate, about 9.5 cm. long and 4 cm. wide, rounded or obtuse at the apex, long-attenuate at the base to a stout stipe about 1 cm. long, densely brown-tomentulose, the valves very much thickened over the seed, the margins thin, acute.

The species is very distinct in its foliage, the leaflets uniformly 5 and with very conspicuous, sharply salient nerves on the lower surface.

Lonchocarpus purpureus Pittier, Contr. U. S. Nat. Herb. 20: 65. f. 13. 1917. *Cocorocho*; *Mataboy* (Huehuetenango).

Stream banks or open forest, 1,500–1,900 meters; as far as known, endemic; Baja Verapaz; Santa Rosa (type from El Carrizal, *Heyde & Lux* 3289); Guatemala; Chimaltenango; Quiché; Huehuetenango.

A small or rather large tree, sometimes 12 meters high, with a broad spreading crown, the branchlets at first brown-puberulent; leaves large, the leaflets 9–11, on petiolules 5–8 mm. long, coriaceous, oblong or elliptic-oblong, 4–10 cm. long, 1.5–4.5 cm. wide, glabrous or nearly so above, gray-green when dried, the nerves often somewhat impressed, densely pilose beneath with short spreading hairs, the costa and nerves strongly elevated, the veins elevated and closely reticulate; racemes axillary or on leafless branches, 5–8 cm. long, fulvous-pubescent, the pedicels 3 mm. long or less, the bracts and bractlets linear, small; calyx broadly campanulate, 3 mm. long, brown-sericeous; petals purple, the standard 9 mm. long, sericeous outside; ovary linear, pubescent, about 4-ovulate; legume 1–3-seeded, 5.5–12 cm. long, 2–3 cm. wide, broadly rounded to subacute at the apex, acute and stipitate at the base, densely and minutely strigillose, thin, conspicuously winged along the upper margin, the wing 2–4 mm. wide, sharp-edged.

This has been reported from Guatemala as *L. sericeus* HBK.

Lonchocarpus rugosus Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 92. 1860 (type from Campeche). *L. apricus* Lundell, Lloydia 2: 90. pl. 4. 1939 (type from Escuintla, Chiapas). *Chaperno*; *Matabuy* (Huehuetenango); *Arripin* (Zacapa).

Moist or dry forest, often along stream banks or on open brushy hillsides, 1,400 meters or lower, chiefly at low elevations; Petén;

Alta Verapaz; Izabal; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Retalhuleu; San Marcos; Huehuetenango. Southern Mexico; British Honduras; Honduras; Salvador.

A small or rather large tree, sometimes 15 meters high, with a broad low crown, often flowering when only a shrub of 2 meters, the young branchlets usually densely brown-tomentose; leaflets 9-17, on petiolules 2-3 mm. long, coriaceous, oblong or elliptic-oblong, mostly 4-6 cm. long but sometimes larger, rounded or very obtuse at the apex, rounded at the base, drying grayish green, densely and finely pubescent above, densely sericeous beneath or pilose with more or less spreading hairs, the lateral nerves numerous, impressed above, salient beneath; racemes usually numerous and paniculate at the ends of the branches, equaling or shorter than the leaves, mostly dense and many-flowered, the rachis tomentose; pedicels 2-4 mm. long, the bractlets orbicular; calyx campanulate, acutish at the base, 2-3 mm. long, densely brown-sericeous; petals red-purple, the standard 8-9 mm. long, densely sericeous outside; ovary 7-8-ovulate; legume thin but much thickened about the seeds, 1-3-seeded, or the seeds rarely as many as 6, densely strigose or sometimes pilose with spreading hairs, often glabrate, 5-14 cm. long, 1.5-2.7 cm. wide, the margins thin and sharp-edged.

Called "canasín" (Maya) and "black cabbage-bark" in British Honduras; "cantzin," "canansin" (Yucatan, Maya); "masicarán," "masicarón" (Honduras); "chapulaltapa" (Salvador). The form described as *L. apricus* at first seems amply distinct from what its author assumed to be typical *L. rugosus*, and it is possible to sort most of the many available specimens into two groups. Unfortunately, there are too many intermediate specimens, combining the various character of fruits, venation, and pubescence in so many different combinations that it seems quite impossible to separate two species. Both forms are sometimes found in the same locality, a fact that suggests they are not distinct. We have seen no type material of *L. rugosus*, and one can only guess which of these forms it represents. It is worth mentioning that specimens of both forms have been identified as *L. rugosus* at Kew, where the type exists. The wood of this tree is of good quality and is used for general construction, axles of *carretas*, and other purposes. In Huehuetenango there is extracted from the bark a purple dye used for coloring textiles.

Lonchocarpus salvadorensis Pittier, Contr. U. S. Nat. Herb. 20: 80. f. 31. 1917. *Chaperno*.

Dry or moist forest, chiefly on plains, often along stream banks or left as a shade tree in coffee plantations, 1,350 meters or less; Santa Rosa; Suchitepéquez; Retalhuleu; Quezaltenango. Salvador, the type from Nahuizalco.

A small to large tree, sometimes 27 meters high with a trunk 60 cm. in diameter, the bark smooth or rough, whitish or gray; young branchlets densely brownish-pubescent; leaflets usually 7, coriaceous or rather thin, on petiolules 5-10 mm. long, ovate to elliptic or obovate, mostly 5-10 cm. long and 2-5 cm. wide, acute or abruptly acuminate, cuneate to rounded at the base, rather densely pilosulous on both surfaces at first, glabrate above; racemes mostly paniculate near the ends of the branches, 12-25 cm. long, puberulent, the pedicels 2 mm. long or less; bractlets suborbicular; calyx 5 mm. long, campanulate, densely sericeous with brown or grayish hairs; petals purple or rose, the standard 1.5 cm. long, sericeous outside; ovary densely pubescent, about 9-ovulate; legume 5-6 cm. long or probably larger, 1.5 cm. wide, broadly rounded at the apex, acute and short-stipitate at the base or almost sessile, densely velutinous-pilosulous, rather thin, the upper margin slightly thickened, sulcate.

Called "cincho" in Salvador, the name applied locally to various species of *Lonchocarpus* because bands of the tough flexible thin bark are employed as the frames of sieves and also to encircle or wrap large cheeses when they are prepared for shipment.

***Lonchocarpus Salvinii* Harms, Repert. Sp. Nov. 17: 323. 1921. Chaperno.**

Chiefly on dry, sparsely wooded hillsides, or along stream banks, often seen in *fincas* or *cafetales*, 750-1,200 meters; endemic; Escuintla; Sacatepéquez (type from Volcán de Fuego, *Salvin*).

A large tree, commonly 12-20 meters high, with a large crown and tall slender trunk, glabrous throughout or nearly so; leaflets 11-13, small, oblong or lance-oblong, 2-3.5 cm. long, 7-12 mm. wide, narrowly obtuse, at the base obtuse or acute, petiolulate; racemes elongate, many-flowered, dense, sometimes 18 cm. long, the pedicels 3-5 mm. long; calyx broadly campanulate, shallowly dentate, 3-4 mm. long; petals glabrous, purple, the standard 10-11 mm. long; ovary pubescent only on the margins, 5-7-ovulate; legume 5-9 cm. long, 1 cm. wide, obtuse or acute and apiculate, acute at the base and subsessile, glabrous, thin, the margins slightly thickened.

There is some question whether this species is really referable to *Lonchocarpus* or would be better placed in *Gliricidia*, to which it shows much resemblance. There are many fruits on recent collections, but none of them are fully mature and it is uncertain whether they are dehiscent or not. The tree is fine and very showy when covered with flowers in the middle of the dry season. It is common and conspicuous on the hillsides between Escuintla and Antigua.

***Lonchocarpus santarosanus* Donn. Smith, Bot. Gaz. 57: 418. 1914.**

At 1,500 meters or less; Santa Rosa (type from Mataquesuintla, *Heyde & Lux* 6328); Suchitepéquez. Salvador.

A tree of 6-8 meters or more, the branchlets and leaf rachis puberulent at first; leaves large, the leaflets usually 11-15, on petiolules 4-6 mm. long, oblong-lanceolate to oblong or ovate-oblong, mostly 5-8.5 cm. long and 1.5-3.5 cm. wide, rather thin, acuminate or long-acuminate, green above and almost glabrous, pale beneath, rather densely and minutely sericeous; racemes axillary, rather lax, 12 cm. long or shorter, rather few-flowered, the rachis puberulent, the pedicels 2-3 mm. long, the peduncles 4-6 mm. long, the bracts and bractlets small, ovate-oblong; calyx broadly campanulate, 1.5-2 mm. long and somewhat wider, minutely sericeous; petals red-purple, the standard 7 mm. long, sericeous outside; ovary stipitate, densely pubescent, 2-ovulate.

Called "chapelno blanco" in Salvador.

LOTUS L.

Plants annual or perennial, herbaceous or suffrutescent, erect to prostrate; leaves alternate, pinnate, the leaflets 3 to numerous, entire; stipules foliaceous, membranaceous, or glanduliform; flowers solitary or umbellate, often subtended by foliaceous bracts; calyx teeth subequal or the lowest one longer; petals free from the stamen tube, usually yellow, often tinged with red or purple, the standard unguiculate, the keel incurved or inflexed, rostrate; vexillar stamen free, the others connate; ovary sessile, 1-many-ovulate; legume usually linear, straight or arcuate, terete, turgid, or sometimes compressed, bivalvate, septate between the seeds or sometimes continuous; seeds varying from one to few or many, subglobose to lenticular, not strophiolate.

Species perhaps 100, widely distributed in chiefly temperate regions of both hemispheres. Only one species has been found in Central America, and in Mexico the species are very few except in the northern states.

Lotus repens (G. Don) Sessé & Moc., comb. nov. *Hosackia repens* G. Don, Gen. Hist. Dichl. Pl. 2: 200. 1832. *L. repens* Sessé & Moc. ex G. Don, loc. cit. as synonym.

Open pine-oak forest, 2,100-2,400 meters; Zacapa (Sierra de las Minas). Southern Mexico.

Plants perennial, herbaceous, the stems numerous, branched, prostrate or procumbent, about 30 cm. long, almost glabrous; stipules triangular, acute or acuminate, 2-5 mm. long; leaves (including the petiole) 2-6 cm. long, 5-9-foliolate, the leaflets obovate-oblong, 1-2 cm. long, 4-8 mm. wide, obtuse or rounded at the apex and mucronate, short-petiolulate, green and glabrous above, somewhat paler and sparsely strigose or glabrous beneath; umbels axillary, usually 5-flowered, on slender peduncles 8-18 cm. long; bract at the base of the umbel short-petiolate, 3-5-foliolate; flowers 10-14 mm. long, rose-purple or rose, short-pedicellate; calyx teeth lanceolate, 3 mm. long, about equaling the tube, sparsely sericeous or almost glabrous; legume linear, about 3 cm. long, compressed, straight or nearly so, glabrous.

LUPINUS L. Lupine

Reference: Charles Piper Smith, *Species Lupinorum* 84-93. 1938.

Annual or perennial herbs, rarely shrubs; leaves digitately 5-15-foliate, rarely simple or 3-foliate, the leaflets entire; stipules adnate to the base of the petiole; flowers small to rather large, usually showy, commonly blue or violaceous, rarely white or yellow, in terminal racemes, scattered or approximate in verticels; bracts usually caducous, the bractlets usually adnate to the base of the calyx; calyx deeply cleft, the 2 upper lobes united to form a 2-fid or 2-dentate lip, the 3 lower ones united to form a 3-dentate or entire lip; standard orbicular or broadly ovate, the wings falcate-oblong or obovate, connate dorsally at the apex; keel incurved, rostrate, included within the wings; stamens all connate, the alternate anthers short and versatile, the others longer and basifixed; ovary sessile, 2-many-ovulate, the style incurved, glabrous, the stigma terminal, usually barbellate; legume more or less compressed, usually linear or oblong, 2-valvate, septate within between the seeds, the valves coriaceous; seeds not strophiolate, the hilum oblong or linear.

Species 300 or more, most numerous in western United States, but there are many in Mexico and the South American Andes, while others occur in the Mediterranean region. One or two additional ones are recorded from southern Central America. The list of Guatemalan species and the key to the species of southern Mexico and Central America provided by Smith are inconsistent, incoherent, and worthless for uses of determination. The characters, some of them obviously worthless, that are used in his key to species do not agree with the collections cited for Guatemala and Mexico. The location of the specimens studied and even of the types of new species published by Smith is usually not indicated, thus further complicating the data in what is probably one of the most unsatisfactory systematic papers ever devoted to Central American plants. The following key is intended to provide for the species that actually are known to occur in Guatemala. We have made extensive collections of the genus in all parts of the country where it is represented, and it is to be expected that all the species are represented in our series.

Stipules large and conspicuous, mostly 3-6 cm. long or even longer. *L. montanus*.
Stipules rather inconspicuous, mostly 2 cm. long or shorter, rarely longer.

Leaflets linear or nearly so; plants annual. *L. angustifolius*.

Leaflets usually much broader than linear; plants perennial.

Stems and petioles pilose with very long, spreading, soft hairs. *L. Ehrenbergii*.

Stems and petioles with pubescence of chiefly or wholly appressed hairs.

Upper lip of the calyx lanceolate; leaflets mostly acute.

Leaflets sublanate on both surfaces. *L. Kellermanianus*.

Leaflets glabrous or nearly so on the upper surface, with a few long subappressed yellowish hairs on the lower surface. *L. Aschenbornii*.

Upper lip of the corolla ovate; leaflets mostly very obtuse. *L. elegans*.

Lupinus angustifolius L. Sp. Pl. 721. 1753.

Native of the Mediterranean region, collected on plains near Tecpám, Chimaltenango, growing at edge of a corn field, *Skutch* 584.

Plants annual, erect, branched, slender, mostly 50 cm. high or less, the stems pilose with short, mostly appressed, sometimes spreading hairs, densely leafy; leaves long-petiolate, the leaflets 5-9, linear, 2-4 cm. long, 2-5 mm. wide, very obtuse or rounded at the apex, glabrous above, sericeous beneath; stipules 7 mm. long, linear; racemes short or elongate, few-many-flowered, short-pedunculate, the bracts small, caducous; calyx lips long and narrow, pilose; corolla bright blue, the standard 12 mm. long; legume 5-7 cm. long, 10-12 mm. wide, hirsute, 5-6-seeded; seeds gray and brown, 7-8 mm. long.

A plant probably of recent introduction into Guatemala, and doubtfully established, like a few other European weeds found in recent years on the plains near Tecpám. In Europe this plant has long been cultivated for its seeds, which sometimes are employed as a coffee substitute.

Lupinus Aschenbornii Schauer, *Linnaea* 20: 739. 1847.

Dry plateau slopes with *Baccharis* and bunchgrass, or in pine and *Juniperus* forest, 3,700-4,600 meters; San Marcos (Volcán de Tajumulco; determination somewhat uncertain); Huehuetenango (near Tojquiá, *Steyermark* 50227). Mountains of southern Mexico; Costa Rica.

Plants probably perennial, erect or ascending, 10-40 cm. high, the stems pilose with very unequal, spreading or subappressed, mostly short hairs; lower leaves long-petiolate, the upper ones short-petiolate, the petioles 3-8 cm. long, sericeous or villous; stipules 15-20 mm. long or often shorter; leaflets 8-10, oblanceolate, 3 cm. long or shorter, acute or subacute, glabrous above or nearly so, sparsely appressed-pilose beneath; racemes 8-10 cm. long, short-pedunculate, many-flowered, the pedicels 1-3 mm. long or often longer; bracts linear, 1 cm. long or shorter, deciduous; flowers 9-13 mm. long; calyx short-pilose, the upper lip 2-dentate, 3-4 mm. long, the lower lip 4-5 mm. long; petals blue, the standard narrow, oblong or obovate, glabrous; legume about 3.5 cm. long and 5-6 mm. wide; ovules 6-8.

Here perhaps belongs a collection from Santiago, Sacatepéquez, reported by Smith as *L. chiapensis* Rose.

Lupinus Ehrenbergii Schlecht. *Linnaea* 12: 334. 1832. *L. Hartwegii* Lindl. Bot. Reg. pl. 31. 1839. *Corazón tranquilo*.

Cultivated commonly for ornament in Guatemalan gardens, especially in the highlands, also in other parts of Central America; occasionally wild in forest, 1,600-2,200 meters; Jalapa; Huehuetenango. Mexico.

Plants perennial, erect, a meter high or less, often much branched, the stems usually densely hirsute or villous with long lax spreading hairs, often also lanate or puberulent; upper leaves short-petiolate, the lower long-petiolate, the petioles 3–10 cm. long, pilose with long spreading soft whitish hairs; stipules mostly 1 cm. long or less, sometimes larger; leaflets 5–9, oblanceolate, acute or obtuse, 7 cm. long and 13 mm. wide or smaller, glabrous above, long-pilose or sparsely sericeous beneath; racemes 8–30 cm. long, dense or lax, pedunculate, the pedicels 2–5 mm. long; bracts linear or lance-setaceous, 5–15 mm. long, mostly deciduous; flowers 10–18 mm. long, varying from violet or blue to (in cultivated forms) pink or white; calyx usually long-pilose, sometimes sericeous, the upper lip 5–6 mm. long, lanceolate, the lower lip 6–8 mm. long, lanceolate, entire; legume 3–4.5 cm. long, 6–7 mm. wide, fulvous-hirsute; ovules 6–9; seeds 4 mm. long.

Known in Salvador by the name "lupina," the classic Spanish name for plants of this genus. The plant is often seen in Central American gardens, where it thrives even when neglected. It has been reported from Central America as *L. hirsutus* L., a European species which it does not resemble very closely.

Lupinus elegans HBK. Nov. Gen. & Sp. 6: 477. 1824. *L. campestris* Cham. & Schlecht. Linnaea 5: 589. 1830. *L. elegans* var. *campestris* C. P. Smith, Sp. Lupin. 77. 1938. (?) *L. Skutchianus* C. P. Smith, Sp. Lupin. 239. 1940 (type collected on plains near Tecpám, A. F. Skutch 491).

Sometimes on brushy hillsides but most often on open hillsides or plains, common in oak or pine forest, sometimes on gravel along streams, 1,500–3,800 meters; Guatemala(?); Sacatepéquez(?); Chimaltenango; Huehuetenango; San Marcos. Southern Mexico; Panama.

An erect perennial a meter high or less, often much branched, the stems mostly slender, appressed-pilose or almost glabrous; leaves small, the petioles equaling or sometimes longer than the leaflets; stipules 12 mm. long or much shorter; leaflets usually 6–7, oblanceolate or linear-oblanceolate, mostly 3.5 cm. long and 6 mm. wide or smaller, rounded to subacute at the apex; racemes mostly 8–15 cm. long, often lax, the pedicels 2–3 mm. long or frequently much longer, with appressed pubescence; bracts lance-aristate, 12 mm. long or shorter, sericeous, deciduous; flowers 13–14 mm. long, blue or purple; calyx laxly sericeous, the upper lip 2-dentate, 4 mm. long, the lower entire, 5 mm. long; standard glabrous; legume commonly 3–3.5 cm. long and 6–7 mm. wide, densely fulvous-hirsute.

The Guatemalan material referred here is more uniform than Mexican material determined by Smith, who has described several varieties from Mexico, mostly based on trivial characters. One collection that he reports from Guatemala as *L. Clarkei* Oerst. (from Sacatepéquez) may well belong to *L. elegans*. The differences between the two supposed species as keyed by Smith certainly do not hold for Central American collections. We have not seen the

type of *L. Skutchianus*, but the description indicates no characters that are not found in *L. elegans*.

Lupinus Kellermanianus C. P. Smith, Sp. Lupin. 90. 1938.

Sacatepéquez (type from Volcán de Agua, 2,700 meters, W. A. Kellerman 4746); Quezaltenango (Volcán Zunil).

Plants perennial, erect, about 50 cm. high; leaves small, the petioles 2–3 cm. long; stipules slender, 10–15 mm. long; leaflets 7–9, oblanceolate, acute, 2.5–3.5 cm. long and 4 mm. wide, sublanate on both surfaces; racemes 3–4 cm. long, on peduncles of equal length, the pedicels 4 mm. long; bracts sometimes persistent, lanceolate, 1 cm. long; flowers few, 10–12 mm. long, purple; calyx lanate, the upper lip 4–5 mm. long, oblong-lanceolate, the lower lip 5–6 mm. long, entire, obtuse; standard glabrous; legume 3.5 cm. long, 8 mm. wide, sublanate; ovules 6.

We have seen no type material of this species. It may well be only a form of *L. elegans*.

Lupinus montanus HBK. Nov. Gen. & Sp. 6: 477. 1824. *L. montanus* var. *austrovolcanicus* C. P. Smith, Sp. Lupin. 90. 1938 (type from Volcán de Santa María, Quezaltenango, E. W. Nelson 3709). *L. flabellaris* Bertol. Fl. Guat. 430. 1840 (type from Volcán de Agua, Sacatepéquez, Velásquez).

Chiefly in open forest of the higher mountains, often in open rocky alpine places, 2,400–4,400 meters; Sacatepéquez; Chimaltenango; Sololá; Huehuetenango; Quezaltenango; San Marcos. Southern Mexico.

A stout erect perennial herb a meter high or less, the stems often branched, densely sericeous to almost glabrous; leaves large, the petioles 10 cm. long or shorter; stipules mostly 3–6 cm. long, broad, very conspicuous; leaflets 8–15, linear-oblanceolate to almost linear, mostly 4–7 cm. long, acute or obtuse, glabrous above, densely sericeous to glabrate beneath; racemes 10–25 cm. long, dense and many-flowered, long-pedunculate, the pedicels 5–10 mm. long; bracts lanceolate, very conspicuous before anthesis, 2 cm. long or shorter, sericeous, deciduous; flowers 1.5 cm. long, purple to blue or violaceous; calyx densely pilose with appressed or lax hairs, the upper lip 5 mm. long, lanceolate, acute, the lower lip 6 mm. long; standard glabrous; legume 4–5 cm. long, 8–11 mm. wide, densely pilose with long or short hairs; ovules 7–8; seeds 4 mm. long.

This has been reported from Guatemala as *L. vaginatus* Cham. & Schlecht. It is a common plant in the open forests of the high volcanoes and when in flower is a handsome and showy one.

MACHAERIUM Persoon

References: Henry Pittier, The Middle American species of *Machaerium*, Contr. U. S. Nat. Herb. 20: 467–477. 1922; F. C.

Hoehne, *Machaerium*, Fl. Brasilica 25, pt. 3, no. 128: 3-100. pls. 1-107. 1941.

Trees or shrubs, often woody vines, often armed with spines; leaves odd-pinnate, mostly alternate, not stipellate; stipules often indurate and spinescent; flowers small or medium-sized, purple, violaceous, or white, in short, secund, axillary, often fasciculate racemes or in terminal panicles, the pedicels short or almost obsolete, the bracts small, caducous; bractlets usually orbicular, persistent; calyx truncate, obtuse at the base, short-dentate; standard broadly ovate or orbicular, not appendaged, usually sericeous outside; wings oblong, generally falcate; keel incurved, the petals connate dorsally; stamens all connate into a sheath or the vexillar one free, the anthers versatile; ovary commonly stipitate and 1-ovulate, the style filiform, incurved, the stigma small, terminal; legume compressed, samaroid, indehiscent, more or less thickened at the base about the seed, attenuate above into a broad reticulate-veined wing; seed compressed, ovate to reniform, the radicle inflexed.

About 120 species in tropical America, with apparently one or more in tropical Africa. Two or three additional species may occur in Central America.

Leaflets acute or acuminate, mostly elliptic.

Leaflets minutely and densely sericeous beneath, 5-11 *M. rosescens*.

Leaflets glabrous beneath or sparsely pilose, never minutely sericeous.

Branchlets densely pilose with long or short, spreading hairs, or hispid, often setose-hispid.

Leaflets mostly 5 cm. long or shorter; branchlets short-pilose.

M. Seemannii.

Leaflets mostly 6-12 cm. long; branches usually hispid or setose-hispid.

M. marginatum.

Branches glabrous or nearly so, the pubescence, if any, inconspicuous and more or less appressed.

Leaflets usually 6-7, lance-oblong or oblong, narrowly long-acuminate.

M. fruticetorum.

Leaflets 3-5, rarely more, mostly broadly elliptic or ovate, abruptly short-acuminate..... *M. arboreum*.

Leaflets broadly rounded at the apex, mostly oblong or oval.

Leaflets small, those of adult branches about 1 cm. long and less than 5 mm. wide..... *M. Merrillii*.

Leaflets larger, mostly 1.5-2 cm. long or often much longer, usually more than 5 mm. wide and often much wider.

Fruit strongly curved, almost orbicular in outline, the wing obsolete.

M. lunatum.

Fruit not curved or only very slightly so, the wing well developed.

Leaflets narrowly oblong, usually rounded and not at all emarginate at the apex, copiously sericeous or pilose beneath.

Leaflets usually 31-41; flowers 9-10 mm. long..... *M. setulosum*.

Leaflets 13-19; flowers 12-13 mm. long..... *M. cobanense*.

Leaflets broadly oblong to oblong-obovate, usually conspicuously emarginate, at least in age glabrate.

Leaflets large, mostly 4-7 cm. long; legume hirsute or hispid about the basal portion..... *M. biovulatum*.

Leaflets mostly 2–3.5 cm. long; legume, as far as known, glabrous or nearly so in age.

Leaflets narrowed toward the base, broadest usually above the middle; stipular spines 2–3 mm. long; calyx 3 mm. long. . . . *M. habroneurum*.

Leaflets usually broad and rounded at the base and generally broadest about the middle; stipular spines often more than 3 mm. long; calyx 4–4.5 mm. long. *M. riparium*.

Machaerium arboreum (Jacq.) Vog. *Linnaea* 11: 182. 1837. *Nissolia arborea* Jacq. *Enum. Pl. Carib.* 27. 1760. *M. acuminatum* HBK. *Nov. Gen. & Sp.* 6: 391. 1824. *M. acuminatum* var. *latifolium* Benth. *Journ. Linn. Soc. Bot.* 4: Suppl. 65. 1860. *M. latifolium* Pittier, *Contr. U. S. Nat. Herb.* 20: 470. 1922. *M. Pittieri* Macbr. *Field Mus. Bot.* 4: 91. 1925. .

Damp to rather dry forest, 450–1,500 meters; Alta Verapaz; Escuintla. Southern Mexico; Honduras and Salvador to Costa Rica; Colombia and Venezuela.

A woody vine or often a shrub or small tree, the slender branchlets sparsely puberulent or glabrate; leaflets 3–5, broadly elliptic to oblong-ovate, mostly 5.5–9 cm. long and 2.5–5.5 cm. wide, abruptly and narrowly long-acuminate, obtuse or rounded at the base, glabrous, drying blackish, more or less lustrous; inflorescences axillary and terminal, solitary, racemose or often much branched, much shorter than the leaves, sordid-tomentulose, the flowers often very numerous, whitish, sessile, 7 mm. long or shorter; legume 10–12 cm. long, stipitate, glabrous in age or nearly so, the wing obtuse or rounded at the apex, 1.5–2 cm. wide, conspicuously reticulate-veined.

Called “chapulaltapa” in Salvador; “mata-piojo” (Honduras). The Central American plant usually has been considered a distinct species, but it seems quite properly referable to the synonymy of *M. arboreum*. Hoehne considers the Central American form a variety, *M. arboreum* var. *latifolium* Hoehne (*Fl. Brasilica* 24, pt. 3, no. 128: 81. 1941), but this differs from the typical form only in having sometimes 4–5 rather than 3 leaflets, and is of slight importance.

Machaerium biovulatum Micheli, *Mém. Soc. Phys. Hist. Nat. Genève* 34: 265. 1890. *M. Langlassei* Micheli ex Pittier, *Contr. U. S. Nat. Herb.* 20: 473. 1922. *Chapernillo*; *Uña de gato*.

Dry thickets or forest, 700 meters or lower; El Progreso; Santa Rosa; Escuintla; Suchitépéquez; Retalhuleu. Southern Mexico; Salvador to Costa Rica.

A tree of 5–12 meters with rounded crown, or sometimes a large woody vine climbing over tall trees, the branchlets at first densely brown-tomentose; stipules indurate and forming small recurved spines; leaflets mostly 13–21, petiolulate,

coriaceous, oblong, mostly 4–7 cm. long and 2–2.5 cm. wide, rounded and more or less emarginate at the apex, obtuse or rounded at the base, green and glabrous above, pale beneath, when young somewhat pilose or villous, at least along the costa, the lateral nerves numerous, fine, approximate; racemes solitary or paniculate, dense and many-flowered, sparsely or densely brownish-tomentose; flowers 11–13 mm. long, deep purple, the pedicels 3 mm. long or shorter; calyx campanulate, 5–6 mm. long, tomentulose; ovary densely villous; legume 5–7 cm. long, the basal portion hispidulous and pilose, the wing 1.5–2 cm. wide, glabrate, rounded at the apex.

Called “zarza” and “uña de gato” in Salvador. It is difficult to separate this from *M. riparium* except with fruit, and it may be that some of the collections referred here to the latter really belong with this species.

Machaerium cobanense Donn. Smith, Bot. Gaz. 44: 108. 1907; Hoehne, Fl. Brasilica 24, pt. 3, no. 128: pl. 28. 1941. *Jocoj* (Cobán, Quechí).

Moist forest or thickets on limestone, sometimes in pine forest, 1,200–1,500 meters; Alta Verapaz (type from Cobán, *Tuerckheim* II.1401); perhaps also in Escuintla, Quezaltenango, and San Marcos (material sterile).

A woody vine as much as 10 meters long, the branchlets densely tomentose or short-villous; stipules indurate and spinescent, acute, recurved, 5 mm. long; leaflets mostly 13–19, subcoriaceous, petiolulate, oblong, generally 2–5 cm. long and 0.5–2.5 cm. wide, obtuse or subacute and mucronate, rounded to subacute at the base, deep green and thinly pilose above, densely pilose beneath, the nerves not very numerous or closely parallel; inflorescence terminal, paniculate, as much as 30 cm. long, the rachis densely fulvous-pilose, the pedicels 1–3.5 mm. long; flowers 12–13 mm. long; calyx tubular-campanulate, 6 mm. long, tomentulose; standard densely pubescent outside; ovary villous; legume unknown.

Several sterile collections from the Pacific lowlands represent either this species or an undescribed one.

Machaerium fruticetorum Standl. & Steyer. Field Mus. Bot. 22: 240. 1940.

Moist or dry, brushy hillsides, 500–1,500 meters; Zacapa; Chiquimula (type collected between Chiquimula and La Laguna, *Steyermark* 30689); Jalapa. Salvador.

A shrub or small tree, as much as 9 meters tall, unarmed, the branches slender, glabrous; stipules deciduous; leaflets 6–7, short-petiolulate, subcoriaceous, narrowly lance-oblong to oblong, the lowest sometimes ovate, 4.5–9 cm. long, 1.5–3 cm. wide, narrowly long-acuminate, with obtuse tip, cuneate-acute to rounded at the base, glabrous, lustrous above, the veins and nerves laxly reticulate; flowers sessile or short-pedicellate; legume 6–10 cm. long, on a stipe 6–12 mm. long,

glabrate in age, the wing 1.7–2.5 cm. wide, rounded at the apex, reticulate-veined, lustrous.

Machaerium habroneurum Standl. Carnegie Inst. Wash. Publ. 461: 63. 1935.

Known only from the type, *W. A. Schipp* S676, collected on the boundary between Petén and British Honduras, in forest, Camp 32, at 810 meters.

A woody vine 12 meters long, the trunk 5 cm. in diameter, the branchlets glabrous or nearly so; stipules persistent, spinescent, 2–3 mm. long, recurved; leaflets 7–9, subcoriaceous, short-petiolulate, broadly cuneate-oblong, 2.5–3.5 cm. long, 1–1.5 cm. wide, retuse, obtuse at the base, glabrous, paler beneath, the nerves numerous and closely parallel; flowers purple, in small dense few-flowered panicles, the branches appressed-setulose, the flowers sessile; calyx 3 mm. long, sparsely sericeous or glabrate, narrowly campanulate; standard sericeous outside, twice as long as the calyx; fruit unknown.

The species is known only from poor material, and its status must remain uncertain until better specimens are collected.

Machaerium lunatum (L. f.) Ducke, Archiv. Jard. Bot. Rio de Janeiro 4: 310. 1925. *Pterocarpus lunatus* L. f. Suppl. Pl. 317. 1781. *Drepanocarpus lunatus* Mey. Prim. Fl. Esseq. 238. 1818.

Wet forest, usually along stream banks, at or little above sea level; British Honduras. Southern Mexico; Panama; South America.

A small or large, woody vine, sometimes 15 meters long, often an arching shrub, the trunk as much as 20 cm. in diameter; stipules persistent, indurate, spinescent, 4–6 mm. long, often recurved; leaflets 5–11, oblong, mostly 1.5–2 cm. long and 1 cm. wide or less, rounded and submarginate at the apex, obtuse or rounded at the base, glabrous or nearly so in age, paler beneath, the lateral nerves very numerous, close, parallel; inflorescences axillary and terminal, often forming a large terminal panicle 30 cm. long, the branches hispidulous; flowers sessile, pink or violaceous, 8–11 mm. long; calyx narrowly campanulate, 5 mm. long, sparsely sericeous or almost glabrous; standard sparsely sericeous outside or glabrous; ovary densely sericeous; legume compressed, strongly curved, almost orbicular in outline, 2–3.5 cm. in greatest diameter, sparsely appressed-pilose or almost glabrous, the wing greatly reduced, thick and hard.

This species usually has been referred to a distinct genus, *Drepanocarpus*, but Ducke is apparently quite correct in placing it in *Machaerium*.

Machaerium marginatum Standl. Journ. Wash. Acad. Sci. 14: 95. 1924 (type collected near San Vicente, Salvador); Hoehne, Fl. Brasílica 24, pt. 3, no. 128: pl. 32. 1941.

Moist or dry thickets or forest, often along stream banks, sometimes in pine forest, 1,200 meters or less; Alta Verapaz; Izabal; Santa Rosa; Escuintla; Retalhuleu; Sololá. Southern Mexico; Honduras and Salvador to Panama.

A large shrub or sometimes a small tree or a small or large, woody vine, the young branches stout, densely brown-pilose and often very densely covered with hard thick-based prickles; stipules persistent, indurate and spinescent, about 1 cm. long, acuminate; leaves large, the rachis usually tomentulose or brown-pilose, glabrate in age; leaflets 9–12 or more, coriaceous, very lustrous, oblong, 8–15 cm. long and 3–6 cm. wide, acute or abruptly acuminate, obtuse or rounded at the base, glabrous above, slightly paler beneath, villous along the costa but in age glabrous elsewhere or nearly so, the petiolules 4–5 mm. long, the leaf margins usually conspicuously thickened, the venation lax and reticulate; inflorescence usually a large terminal panicle, often 30 cm. long or larger, much branched, the pedicels 2 mm. long; calyx 5–8 mm. long, sparsely yellow-setose; petals dirty pinkish white, the standard sericeous outside; ovary densely appressed-pilose; legume about 6 cm. long, densely brownish-tomentose at first, sparsely setose-hirsute, the wing 1.8 cm. wide, rounded at the apex.

Called “sangre bravo” in Salvador. The shrub is common on the plains of the Pacific lowlands.

Machaerium Merrillii Standl. Field Mus. Bot. 8: 15. 1930; Hoehne, Fl. Brasilica 24, pt. 3, no. 128: pl. 6. 1941.

Wet thickets or forest, sometimes in open pine forest, 300 meters or less; Petén; Izabal. British Honduras, the type from Stann Creek Railway, W. A. Schipp 113.

A small or large, woody vine, sometimes 15 meters long, the trunk 10 cm. in diameter, frequently a large shrub or small tree and suberect, the young branchlets usually densely setose-hispid with long stiff spreading hairs; stipules persistent, spinescent, indurate, mostly 5–7 mm. long, usually recurved; leaflets about 45, very shortly petiolulate, oblong, mostly 5–9 mm. long and 3 mm. wide but sometimes larger, especially on sterile shoots, shallowly retuse, rounded at the base, glabrous above, paler beneath, minutely puberulent along the costa, the nerves inconspicuous but numerous and rather closely parallel; flowers pale pink, in large terminal panicles, the branches hispid and tomentulose, the pedicels 1–2 mm. long; calyx narrowly campanulate, 5 mm. long, sericeous; standard 8 mm. long, sericeous outside; legume 7 cm. long, the basal portion densely setose-hispid, the wing 1.8 cm. wide, thin and pale, more or less hirsute, reticulate-veined.

The species was named for Dr. Elmer D. Merrill, at that time Director of the New York Botanical Garden.

Machaerium riparium Brandeg. Univ. Calif. Publ. Bot. 6: 500. 1919. *M. acanthothyrsus* Pittier, Contr. U. S. Nat. Herb. 20: 473. 1922. *Uña de gato*.

Moist or dry thickets or forest, often along rocky stream banks, 1,400 meters or less, mostly at 300 meters or lower; Santa Rosa; Escuintla; Guatemala; Retalhuleu. Southern Mexico.

Sometimes a large suberect shrub but usually a large woody vine, the branches glabrous; stipules persistent, indurate and spinescent, recurved, about 5 mm. long; leaflets about 9, mostly 2-3 cm. long, often somewhat larger, broadly oblong or oval, usually broadest toward the apex, rounded and emarginate at the apex, somewhat narrowed and obtuse at the base, glabrous, bright green above, paler beneath, the nerves very numerous and closely parallel; inflorescences usually forming large dense terminal panicles, these often 30 cm. long, hirtellous or hispidulous in flower, glabrate in age, the pedicels 3-4 mm. long; calyx campanulate, 4 mm. long, ferruginous, sparsely short-pilose; petals pale violet, the standard 7-8 mm. long, sericeous outside; ovary villous; legume stipitate, 6-7 cm. long, in age glabrous or nearly so, the wing 2 cm. wide, rounded at the apex, conspicuously reticulate-veined.

Machaerium roscens Standl. Carnegie Inst. Wash. Publ. 461: 64. 1935.

British Honduras; type from forest, Big Rock, Toledo, W. A. Schipp 1091; collected also along Temash River, at 60 meters.

A large woody vine, 9-25 meters long, the trunk 10 cm. or more in diameter, the branchlets sparsely and minutely sericeous; stipules persistent and indurate, triangular-oblong, 3-4 mm. long, suberect, scarcely spinescent; leaflets 5-7, coriaceous, petiolulate, oblong or ovate-oblong, 4.5-7 cm. long, 1.8-2.5 cm. wide, acute or shortly obtuse-acuminate, rounded at the base, glabrous above, paler beneath, densely and minutely yellowish-sericeous, the nerves distant, few; flowers white flushed with pink, in large lax terminal pyramidal panicles as much as 25 cm. long, the branches minutely brown-sericeous; calyx campanulate, 3 mm. long, brown-pilosulous; standard 6-7 mm. long, minutely sericeous outside; fruit unknown.

Machaerium Seemannii Benth. in Seem. Bot. Voy. Herald 110. 1853. *Tamarindo* (Huehuetenango).

Wet forest or thickets, sometimes in open pine forest, 1,300 meters or lower; Petén; Alta Verapaz; Izabal; Chimaltenango; Quiché; Huehuetenango. British Honduras; Costa Rica; Panama.

A small or large, woody vine, sometimes 25 meters long, the slender branchlets brown-pilose or hirtellous; leaflets 7-11, thin-coriaceous, short-petiolulate, ovate or ovate-lanceolate, 2-5 cm. long, mostly 1-2 cm. wide, obtuse-acuminate, often narrowly so, rounded at the base, lustrous, glabrous above, brown-pilose beneath with rather long and stiff hairs principally on the costa, the veins and nerves laxly reticulate, not closely parallel; inflorescences axillary or terminal, racemose, the branches brown-hirsutulous, the flowers sessile, 7 mm. long, dull dirty purple; calyx campanulate, 3-3.5 mm. long, densely strigose; standard densely brown-sericeous outside; ovary densely pubescent; legume 5-6 cm. long, short-stipitate,

at first densely sericeous, often glabrate in age, the wing 1.5 cm. wide, obtuse or rounded at the apex.

Machaerium setulosum Pittier, Contr. U. S. Nat. Herb. 20: 477. 1922.

Moist or rather dry forest or thickets, 1,150 meters or less; Petén; Alta Verapaz; Baja Verapaz; Escuintla; Retalhuleu. Southern Mexico; British Honduras; Honduras.

A small or large, woody vine, sometimes 12 meters long, the trunk as much as 10 cm. in diameter, the young branches sparsely or densely brown-villous; stipules indurate and spinescent, acutely lanceolate, 1 cm. long or less, persistent, spreading or recurved; leaves rather large, the leaflets 31-49, oblong, 2.5-4 cm. long, 7-13 mm. wide, rounded and somewhat emarginate at the apex, rounded at the base, villous or glabrate above, densely villous and paler beneath, the nerves numerous, inconspicuous, closely parallel; inflorescence terminal, paniculate, commonly large and 15-30 cm. long, the branches densely pilose or villous, the pedicels 2-5 mm. long; flowers rose-purple or violaceous, 1 cm. long; calyx campanulate, 5 mm. long, sparsely setulose; standard densely sericeous outside; ovary grayish-villosulous; young fruits long-stipitate, sparsely villous, the mature ones apparently unknown.

Called "uña de gato" in Veracruz; "quebracho espino" (Honduras).

MEDICAGO L.

Annual or perennial herbs; leaves pinnately 3-foliate; veins of the leaflets often excurrent as small teeth; stipules adnate to the petiole; flowers small, yellow or violaceous, in axillary racemes or heads, rarely subsolitary, the bracts small or none; bractlets none; calyx small and short, the teeth or lobes subequal; standard obovate or oblong, subsessile, the wings oblong; keel obtuse, shorter than the wings; vexillar stamen free, the anthers uniform; ovary sessile or short-stipitate, several-many-ovulate, the style subulate, glabrous, the stigma subcapitate, oblique; legume spirally falcate or usually cochleate, arcuate-reticulate, spiny or unarmed, scarcely dehiscent; seeds not strophiolate.

About 50 species, in Europe, Asia, and Africa. Several species are introduced or cultivated in America, chiefly in temperate regions. One other species has been found in Costa Rica.

Plants perennial, erect; flowers violet. *M. sativa*.

Plants annual, prostrate or procumbent; flowers yellow.

Legume unarmed, coiled in one plane, 1-seeded; flowers rather numerous, in ovoid racemes. *M. lupulina*.

Legume armed with spines, spirally coiled, several-seeded; flowers few, subcapitate. *M. hispida*.

Medicago hispida Gaertn. Fruct. & Sem. 2: 349. 1791. *M. denticulata* Willd. Sp. Pl. 3: 1414. 1803.

Native of Europe and Asia; established locally in Guatemala as a weed, chiefly in waste ground about dwellings, 1,500–2,700 meters; Guatemala; Totonicapán; Huehuetenango; Quezaltenango. Naturalized in many temperate regions of North and South America.

Plants annual, branched from the base, the branches procumbent or ascending, glabrous or with sparse appressed hairs; leaves petiolate, small, the leaflets cuneate-obovate, 1–1.5 cm. long, rounded at the apex and emarginate, cuneate at the base, crenulate, glabrous or nearly so; stipules dentate; flowers few, yellow, 2 mm. long, in small pedunculate heads; legume with the spines about 8 mm. in diameter, glabrous, spirally twisted in 2–3 coils, armed with numerous green spines.

This plant is an abundant weed in the plaza at Huehuetenango, growing in grass of the lawns and giving almost the same effect as white clover (*Trifolium repens*). In Central America this species has apparently become established also in Costa Rica. The English name is “bur clover.”

Medicago lupulina L. Sp. Pl. 779. 1753.

A weed in moist fields, about 2,300 meters; Quezaltenango (Quezaltenango, *Standley* 66441). Native of Europe, Asia, and northern Africa; widely established as a weed in temperate North and South America; unknown elsewhere in Central America.

Plants annual, finely pilose on the stems and leaves, branched, decumbent or procumbent, the stems 50 cm. long or less; leaves petiolate, the leaflets obovate to oval or suborbicular, mostly 10–15 mm. long, rounded at the apex, emarginate, denticulate, obtuse or rounded at the base; stipules ovate or lanceolate, dentate; peduncles 1.5–3 cm. long, almost filiform, the racemes ovoid, 4–10 mm. long; flowers bright yellow, 2 mm. long; legume sparsely pubescent, black when mature, slightly curved, turgid, unarmed, 1-seeded, conspicuously reticulate-veined.

The English name is “black medic.” In Europe this is sometimes grown as a forage plant.

Medicago sativa L. Sp. Pl. 778. 1753. Alfalfa.

Native of Europe, Asia, and northern Africa; widely cultivated for pasture and hay in temperate regions of North and South America, sometimes becoming more or less naturalized; planted for green fodder on a limited scale in the mountains of central and western Guatemala, especially about Antigua and Quezaltenango.

A much branched perennial with very deep roots, usually erect and 60 cm. high or less, the young stems sparsely pilose; leaves petiolate, the leaflets oblanceolate, 1–2.5 cm. long, obtuse, dentate, often emarginate, attenuate to the base, sparsely pilose; stipules entire; flowers violet, in short dense pedunculate racemes; petals 5–6 mm. long; legume pubescent, unarmed, twisted into 2–3 spirals.

Rather strangely, the name "alfalfa" is applied to an *aldea*, La Alfalfa, of Huehuetenango. The name is used for this plant in both Spanish and English, but it is of Arabic origin. In the United States, especially in the West, alfalfa is a very important hay plant, and it is grown extensively in many parts of Mexico for hay and green fodder. In Guatemala the plants are fed green, and there are flourishing fields about Antigua, as well as in some other places. Alfalfa must have been introduced into America by the Spaniards soon after the Conquest. It is one of the best forage and hay plants for stock of all kinds, and the tender branches are found to be suitable for human food, although they have been little used for the purpose. Alfalfa meal is added to many of the prepared baby foods used in the United States, serving presumably as the source of certain vitamins.

MELILOTUS Hill. Sweet clover

Annual or biennial herbs; leaves pinnately 3-foliate, the veins of the leaflets usually excurrent as teeth; stipules adnate to the petioles; flowers small, yellow or white, often fragrant, in axillary, short or elongate racemes, the bracts minute or none; bractlets none; calyx teeth short, subequal; standard obovate or oblong, subsessile, the wings oblong; keel obtuse, shorter than the wings; vexillar stamen free or connate at the middle with the others, the anthers uniform; ovary sessile or stipitate, few-ovulate, the style filiform, the stigma terminal; legume subglobose or ovoid, longer than the calyx, thick, straight, indehiscent or tardily 2-valvate; seeds small, solitary or few, not strophiolate.

About 10 species, in the northern hemisphere of the Old World. A few have become extensively naturalized in temperate regions of North and South America, where they are noxious weeds. Some of the species are sometimes planted for forage for stock, or as green manure. Only the following is known in Central America.

Melilotus indica (L.) All. Fl. Pedem. 1: 308. 1785. *Trifolium Melilotus* var. *indica* L. Sp. Pl. 765. 1753. *Trébol*.

Native of the Mediterranean region; naturalized as a weed in many parts of western North America and of temperate South America; common in many parts of Mexico; found rarely in Guatemala in waste or cultivated ground or in moist fields, 1,500-3,800 meters; Sacatepéquez; San Marcos; unknown elsewhere in Central America.

Plants annual, erect or nearly so, 30-50 cm. high, branched, sparsely pilose on the younger parts; leaflets cuneate-oblongate to almost linear, obtuse or rounded at the apex, attenuate to the base, 1-2 cm. long, serrate; stipules 8-12 mm. long, lanceolate, dentate; racemes elongate and many-flowered, much longer

than the leaves, lax, the flowers short-pedicellate, bright yellow, 2-3 mm. long; legume subglobose, 2-2.5 mm. long, apiculate, glabrous, conspicuously nerved.

MINKELERSIA Martens & Galeotti

Reference: C. V. Piper, Contr. U. S. Nat. Herb. 22: 670-672. 1926.

Small slender herbs, prostrate or twining; leaves pinnately 3-foliolate, stipellate; stipules membranaceous-foliaceous, not produced at the base; peduncles axillary and 1-2-flowered, or sometimes bearing several racemose flowers, the bracts stipuliform; calyx tube short, the lobes large, oblong, subequal; standard obovate-oblong, erect, not appendaged at the base; wings shorter than the standard, slightly adherent to the keel; keel linear, spirally coiled at the apex; vexillar stamen free, the others connate, the anthers uniform; ovary sessile, many-ovulate; style elongate, twisted above and longitudinally barbate, the stigma large, oblique or lateral; legume elongate-linear, compressed, 2-valvate.

Four species, in Mexico and Guatemala.

Minkeliersia galactioides Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 200. 1843.

Known in Guatemala from a single collection, presumably from Quiché. Widely distributed in Mexico.

Perennial from a small globose tuber, glabrous throughout or nearly so, the stems prostrate or twining; stipules persistent, green, broadly ovate, obtuse, about 8 mm. long; leaves long-petiolate; leaflets broadly ovate or rhombic-ovate to orbicular, 1-2 cm. long, rounded at the apex, sometimes sparsely and inconspicuously pilose beneath; peduncles equaling or longer than the flowers, 1-2-flowered, the bracts similar to the stipules; calyx 1 cm. long or longer, green, the lobes oblong, much longer than the tube, ciliate, erect; corolla purple or violaceous, almost 3 cm. long; legume about 4 cm. long and 3 mm. wide, long-attenuate, short-pilose.

The flowers are described as showy; they are very large for the size of the plant.

MUCUNA Adanson

Scandent herbs or shrubs; leaves pinnately 3-foliolate, large, usually stipellate; stipules deciduous; flowers large and showy, mostly dark purple or red or greenish yellow, fasciculate-racemose on axillary peduncles or subcymose at the apex of the peduncle, the peduncles often greatly elongate, pendent, and cord-like; bracts small or caducous; upper 2 calyx teeth wholly connate, the lowest tooth longer than the others; standard complicate, shorter than the wings, with inflexed auricles at the base; wings oblong or ovate, incurved, often adherent to the keel; keel equaling or longer than the wings, incurved at the apex, acute or cartilaginous-rostrate; vexillar stamen free, the others connate; alternate anthers longer and subbasifixed, the others shorter, versatile, usually barbate; ovary sessile, villous, few-ovulate, the style filiform, not barbate, the stigma small, terminal; legume

thick, ovate to oblong or linear, often covered with stinging hairs, 2-valvate, septate within between the seeds, the valves coriaceous, cristate or naked; seeds rounded or transverse-oblong, the hilum short or linear, not strophiolate.

About 50 species, in the tropics of both hemispheres. One other species is known from Central America.

Legume 2 cm. wide or less, densely covered with stinging hairs; seeds about 1 cm. wide; plants herbaceous; flowers racemose on short peduncles; leaflets densely pubescent beneath; flowers black-purple, the standard half as long as the keel or shorter.....*M. pruriens*.

Legume 3.5 cm. wide or wider; seeds usually more than 2 cm. wide; woody vines; flowers usually subumbellate on an elongate pendent peduncle.

Leaflets glabrous beneath; flowers flesh-colored or purple.....*M. urens*.

Leaflets sparsely or densely strigose or sericeous beneath; flowers yellow or greenish yellow.

Legume densely setose-strigose, often constricted between the seeds; flowers 3.5 cm. long; leaflets densely strigose beneath.....*M. argyrophylla*.

Legume hispid with spreading irritant hairs, not or scarcely constricted between the seeds; flowers 5-7 cm. long.

Leaflets densely sericeous beneath, the lateral ones obliquely ovate or rhombic; flowers 6 cm. long.....*M. Sloanei*.

Leaflets very sparsely strigose beneath, all elliptic; flowers 7 cm. long.

M. rostrata.

Mucuna argyrophylla* Standl. Contr. U. S. Nat. Herb. 23: 504. 1922. *Ojo de venado; Ojo de toro; Ojo de caballo; Ojo de buey.

Moist or wet thickets or forest, 1,500 meters or less; Petén; Alta Verapaz; Jalapa; Jutiapa; Santa Rosa; Chimaltenango; Sololá; Suchitepéquez; Retalhuleu; Huehuetenango; Quezaltenango; San Marcos. Southern Mexico; Salvador.

A large woody vine, often climbing over large trees, the young stems densely whitish-strigose; leaves long-petiolate, the leaflets broadly ovate-rhombic, 8-20 cm. long, usually abruptly acuminate, rounded to subcordate at the base, setose-strigose above at first, in age usually glabrate, densely setose-strigose beneath with closely appressed, silvery hairs; peduncles usually greatly elongate and cord-like, pendent below the branches, often a meter long or more, the inflorescence dense, racemiform, 2.5-6.5 cm. long, the pedicels 4-5 cm. long; calyx 12 mm. long and broad, densely sericeous, the teeth very short, obtuse; standard 2 cm. wide when flattened out, the blade 2 cm. long; wings about as long as the standard, 7-8 mm. wide; keel 4.5 cm. long, 1 cm. wide, rounded at the apex; legume 15-25 cm. long, 4.5-5 cm. wide, 2-5-seeded, usually constricted between the seeds, the valves smooth, densely setose-strigose with whitish or sometimes brownish hairs, comparatively thin; seeds orbicular, strongly compressed, black, lustrous, 3 cm. broad, the hilum half the circumference.

This species has been confused with *M. Andreana* Micheli, and has been reported from Guatemala under that name. The latter species extends from Colombia north to Costa Rica, but we have seen

no specimens from farther north. In it the pubescence of the lower leaf surface consists of short, soft, conspicuously spreading hairs. This and related species are well known in Guatemala because of their distinctive large seeds, known generally by the name "ojo de venado" (deer eyes). The Indians sometimes carry the seeds to avert the evil eye, because the seeds resemble eyes. There is also a general belief that if the seeds, usually two of them, *hembra* and *macho* (female and male), are carried on the person, one is protected against hemorrhoids. In order to determine to which sex the seeds belong, they are placed in water. Those that sink to the bottom are *hembras*, those that float are *machos*. This or one of the other species gives a very permanent and black dye. Combined with the scale insect called "aijshi" and alum, it affords a superior black gloss used by the Indians of Rabinal for decorating their famous *jicaras* or cups made from the fruits of *Crescentia*.

Mucuna pruriens (L.) DC. Prodr. 2: 405. 1825. *Dolichos pruriens* L. Syst. Nat. ed. 10. 1162. 1759. *M. prurita* Wight in Hook. Bot. Misc. 2: 348. 1838. *Stizolobium prurimum* Piper, Proc. Biol. Soc. Wash. 30: 54. 1917. *Picapica*.

Common in moist or dry thickets or in lowland forest, often in hedges, 1,000 meters or less; El Progreso; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Baja Verapaz; doubtless also in most of the lowlands. Southern Mexico; British Honduras to Salvador and Panama; West Indies; South America; Old World tropics.

A small or large, herbaceous vine, growing over shrubs and small trees, the stems short-pilose; leaflets rhombic-ovate, very asymmetric, thin, 8-15 cm. long, obtuse or acute, sparsely or densely pilose above, more densely pilose beneath; racemes mostly short-pedunculate, 30 cm. long or less, dark dull brownish purple; calyx tube 5 mm. long and often much broader, densely pilose and setulose, the lowest tooth 10 mm. long or shorter; standard 2 cm. long, half as long as the wings; keel 4.5 cm. long, incurved and acutely cartilaginous-tipped; legume oblong, densely pubescent and covered with long stiff irritant hairs, with a longitudinal costa remote from the margins on each valve; seeds 2-6, transverse-oblong, black, lustrous, 1-1.5 cm. long, the hilum white, 7 mm. long.

Called "cow-itch" and "nettle" in British Honduras; "chiican" (Yucatan, Maya). *Picapica* is all too plentiful and generally known in Guatemala, as in other parts of Central America, but fortunately it is confined to the lowlands and to drier areas. It is strictly an annual, growing luxuriantly during the rainy months, but withering during the *verano*, so that one may travel for miles during the latter

season without seeing green plants. The pods remain on the dry vines, and if the plants are shaken, one will be assailed by a cloud of bristles that cause almost unbearable itching and burning when they penetrate the skin. They are a real danger to the eyes. Unbelievable as it may appear, these hairs, stirred in *atol* or other beverages, or mixed with honey or sirup, are administered commonly to children and adults to expel the intestinal parasites so often infesting dwellers in the tropics. Such use, said to have been even more common and widespread in former times, is reported to have sometimes unfortunate effects. It is stated that if cattle eat the pods too freely, they suffer serious stomach troubles. Some botanical writers claim that this species is a native of Asia and has been introduced into tropical America, but one familiar with its distribution and abundance along the Pacific coast of Central America is inclined to doubt such a statement. The plant has every appearance of being native, and is a typical element of the Pacific plains flora. Varieties of the plant having a smaller quantity of the irritant hairs have been widely grown in the southern United States, under the name "velvet bean," as forage and fodder for stock, especially during the winter months. Both foliage and pods are eaten. The green seeds are used for human food in India, and the plants have been utilized also as a green manure. They grow luxuriantly in cultivation (as one familiar with them in the wild state in Central America can well believe), sometimes attaining a length of 30 meters in three or four months, and produce large quantities of fodder.

Mucuna rostrata Benth. in Mart. Fl. Bras. 15, pt. 1: 171. *pl.* 47. 1859.

Wet to dry thickets or forest, 300 meters or less; Izabal; Retalhuleu; Quezaltenango. British Honduras; Honduras; Panama; southward to Amazonian Brazil.

A large, more or less woody vine, the young branches pilosulous; leaflets rather thin, broadly rhombic-ovate, mostly 9-16 cm. long, abruptly acuminate, broadly rounded at the base, sparsely setulose-strigose beneath with short hairs; peduncles short or elongate, the flowers numerous, 7 cm. long, yellow, the stout pedicels 6-8 mm. long; calyx densely sericeous, the tube 1 cm. long and broader, the lowest lobe equaling the tube; standard short-unguiculate, the blade about 3.5 cm. long, the wings 5 cm. long; keel strongly arcuate above, contracted into a cartilaginous beak; seeds orbicular, somewhat compressed, black, almost 3 cm. in diameter.

In Honduras the seeds are called "ojos de venado," the flowers, "gallitos."

Mucuna Sloanei Fawc. & Rendle, Journ. Bot. 55: 36. 1917.

Moist or dry forest or thickets, 350 meters or less; Escuintla. Southern Mexico; British Honduras; Salvador; Costa Rica; West Indies; South America; tropical Africa.

Usually a large woody vine, the stems whitish-strigose; leaflets thin, ovate to oblong or rhombic-ovate, 8-15 cm. long, acuminate, thinly strigillose above, densely silvery-sericeous beneath, at least when young; peduncles usually much elongate and cord-like, pendent, the flowers subumbellate, short-pedicellate; calyx tube 1 cm. long and often broader, densely sericeous and bearing scattered irritant hairs, the lowest lobe 8 mm. long; corolla yellow, the standard 4 cm. long and 2.5 cm. wide, the wings 6.5 cm. long; keel about equaling the wings; legume oblong, transversely cristate and with longitudinal costae near the margins, densely pubescent and covered with stinging spreading setae, 10-18 cm. long, 4-6 cm. wide; seeds 2-4, orbicular, almost surrounded by the hilum, 2-3 cm. in diameter, dark brownish gray.

The green seeds are said to have been eaten by the Caribs of the West Indies, and they were formerly used in the Antilles for making buttons and snuffboxes. The leaves are said to furnish a black dye. The hairs of the pods are intensely irritant, and were formerly used like those of *M. pruriens*.

Mucuna urens (L.) DC. Prodr. 2: 405. 1825. *Dolichos urens* L. Syst. Nat. ed. 10. 1162. 1759. *D. altissimus* Jacq. Enum. Pl. Carib. 27. 1760. *M. altissima* DC. loc. cit.

Wet thickets or forest, at or near sea level, sometimes in *Manicaria* swamps; Izabal. Costa Rica; Panama; West Indies; Guianas and Brazil.

A large woody vine, glabrous or nearly so except in the inflorescence; leaflets mostly elliptic, blackening when dried, lustrous, 7-12 cm. long, abruptly short-acuminate; peduncles usually elongate and pendent, the pedicels 1 cm. long or in fruit much longer, 2-3 together on enlarged nodes; calyx 1 cm. long and broad, densely sericeous, bearing a few bristly setae; petals violaceous, the standard 3.5 cm. long; legume sessile, oblong, 10-20 cm. long, 5 cm. wide, with numerous transverse crests and with 2 longitudinal costae near the lower suture, pubescent and covered with irritant setae; seeds 1-4, compressed or subglobose, orbicular, almost surrounded by the linear hilum, brownish fuscous.

The seeds of this and related species (excluding *M. pruriens*) are among the sea beans found commonly on tropical shores, and they are sometimes carried across the Atlantic by ocean currents.

MUELLERA L. f.

Shrubs or trees, unarmed; stipules minute; leaves alternate, odd-pinnate, the leaflets few, entire; inflorescence racemose, the flowers geminate on short peduncles

along an axillary rachis, the bracts and bractlets small and inconspicuous; calyx campanulate, shallowly 5-dentate; petals unguiculate, glabrous, the standard ovate, obtuse, not appendaged at the base; wings narrowly falcate-oblong, auriculate at the base, adherent to the keel; keel shorter than the wings; stamens monadelphous, the vexillar stamen free at the base; ovary several-ovulate; legume terete, with 1 or more seeds, moniliform, constricted between the seeds; seeds large, slightly compressed.

Two species, in tropical America. Only the following is known definitely in North America, although one of rather doubtful standing has been based upon supposedly Mexican material.

Muelleria frutescens (Aubl.) Standl. Trop. Woods 34: 41. 1933. *Coublandia frutescens* Aubl. Pl. Guian. 937. pl. 356. 1775. *M. moniliformis* L. f. Suppl. Pl. 329. 1781. *Tzol* (Alta Verapaz).

Moist or wet thickets or forest, often along stream banks, 1,400 meters or less, chiefly at or near sea level; Alta Verapaz; Izabal; San Marcos. British Honduras; Panama; northern and Amazonian South America.

A shrub or small tree, sometimes 15 meters high but flowering when only 1.5 meters high, almost glabrous; leaves rather large, long-petiolate; leaflets 5, long-petiolulate, oblong or ovate-oblong, 5–12 cm. long, 2.5–4.5 cm. wide, acute or acuminate, pale when dried, subcoriaceous, inconspicuously pellucid-punctate, inconspicuously and very minutely sericeous beneath with lustrous hairs or almost wholly glabrous; racemes axillary, sparsely and minutely sericeous with lustrous hairs, 4–10 cm. long, the slender pedicels 6–9 mm. long; calyx 5 mm. long and broad, oblique at the base, minutely sericeous; petals rose, 18 mm. long, the standard 1 cm. wide; keel subobtuse, straight; ovary with 6 or fewer ovules; legume 1–4-seeded, long-stipitate, deeply constricted between the seeds, glabrous, the joints subglobose, about 3 cm. in diameter, with corky walls; seeds compressed, suborbicular, 1.5 cm. long and broad and 1 cm. thick.

The fruits are variable and sometimes deceptive in appearance. Often they consist of only a single joint, and then appear quite unlike normal constricted pods with 2–4 seeds.

MYROSPERMUM Jacquin

Shrubs or small trees; leaves odd-pinnate, the leaflets not stipellate, bearing numerous translucent dots and lines; flowers rather large, white, in simple axillary racemes; calyx turbinate, membranaceous, the teeth short and broad; standard petal obovate, the 4 lower petals almost alike, free, falcate-lanceolate; stamens free, persistent, the filaments elongate, the anthers very small; ovary stipitate, 2–several-ovulate at the middle, the style subulate, the stigma small, terminal; legume stipitate, compressed, indehiscent, indurate and 1-seeded at the apex, narrowed below into a long broad wing; seed 1, oblong, with a thin testa; cotyledons plano-convex, the radicle incurved.

The genus consists of a single species.

Myrospermum frutescens Jacq. Enum. Pl. Carib. 20. 1760.

Dry brushy rocky hillsides, 400–600 meters; Chiquimula (between Ramírez and Cumbre de Chiquimula, on the road between Chiquimula and Zacapa, *Standley* 74454); doubtless also in Zacapa. Guerrero, Mexico; Nicaragua; Costa Rica; Puerto Rico; Trinidad; Colombia; Venezuela.

A shrub or small tree, commonly 2–5 meters high, in South America reported to attain a height of 25 meters, glabrous outside the inflorescence or variously pubescent; leaflets 11–17, thin, oblong, 2–5 cm. long, rounded or retuse at the apex, obliquely subtruncate or cuneate at the apex, short-petiolulate, glabrous above, thinly short-pilose or glabrous beneath; racemes terminal or in the upper leaf axils, usually appearing when the branches are leafless, long-pedunculate, few-flowered; calyx densely pubescent, abruptly constricted below the middle; standard 1.5 cm. long; legume 5–8 cm. long, somewhat curved, about 1 cm. broad; seed compressed, 1 cm. long.

The tree is said to be known in Nicaragua by the name “chiquirín,” the term applied commonly in Central America to a cicada whose notes approximate the sound of its name. The tree perhaps receives this name because of the form of its fruit. In Guerrero the local name of the tree is “cuerillo.” The wood of *Myrospermum* is brown with a greenish or purplish tinge, the sapwood white or yellowish; it is very hard, sometimes extremely so, heavy, compact, tough, and strong; it finishes smoothly and has a lustrous natural polish. The shrub must be rare and local in Guatemala, as it apparently is in other parts of its range. Apparently not more than three collections of it have been made in Central America, and little is known regarding its occurrence there.

MYROXYLON L. f.

Reference: H. Harms, Zur Nomenclatur des Perubalsambaumes, Notizbl. Bot. Gart. Berlin 5: 85–98. 1908.

Unarmed trees; leaves odd-pinnate, the leaflets few, entire, alternate, petiolulate, with numerous close pellucid dots or lines; flowers in terminal and axillary, sometimes paniculate racemes, medium-sized, the bracts and bractlets small, deciduous; calyx campanulate, shallowly and unequally 5-dentate; standard unguiculate, the wings and keel petals free, subequal, narrowly spatulate; stamens 10, equal, free, the anthers oblong, acuminate; ovary long-stipitate, 1-ovulate at the apex; style filiform, the stigma small, terminal; legume short-stipitate, bearing a single seed at the apex, the lower portion of the fruit sterile, broadly winged.

Two species, in tropical America, only the following in North America. The other species, *M. peruiferum* L. f., ranges from Colombia to Bolivia and Brazil.

Myroxylon balsamum (L.) Harms, Notizbl. Bot. Gart. Berlin 5: 94. 1908.

Native in Venezuela and Colombia, and perhaps elsewhere; represented in Mexico and Central America by the following variety:

Myroxylon balsamum var. **Pereirae** (Royle) Harms, Notizbl. Bot. Gart. Berlin 5: 95. 1908. *M. Pereirae* Royle, Man. Mat. Med. ed. 2. 414. 1853. *Toluifera Pereirae* Baill. Hist. Pl. 2: 383. 1870. *Bálsamo*; *Nabá* (Maya).

Wet to dry, lowland forest, 300 meters or less; sometimes planted at higher elevations; doubtless in Petén; Escuintla; Suchitepéquez; Retalhuleu; Huehuetenango; Quezaltenango; probably in all the Pacific coast departments. Veracruz and Oaxaca to Yucatan and Chiapas; British Honduras; Salvador; Honduras; Costa Rica; Panama.

A tall slender tree, sometimes 35 meters high with a trunk almost a meter in diameter at the base, the bark pale gray; leaflets 7-11, ovate to oblong, 3-8 cm. long, 2-4 cm. wide, rather thin, obtuse or short-acuminate, often emarginate, bright green, glabrous; racemes minutely tomentose, equaling or shorter than the leaves, the flowers white or whitish; pedicels 1.5 cm. long or shorter; calyx 4-6 mm. long, whitish-tomentulose; standard 12 mm. long, 8 mm. wide, the other petals shorter; legume about 8 cm. long, 2.5-3 cm. wide at the apical seed-bearing portion, much thickened around the seed, the lower sterile portion about 2 cm. wide, thin, the whole fruit samaroid.

The usual name for the tree in Central America is "bálsamo" or "palo de bálsamo," but in Costa Rica the name "chirraca" sometimes is used. This tree is said to be rather plentiful in the lowlands of the Pacific slope, but we have obtained few data regarding its occurrence. It often is planted about *fincas* as a shade tree, and it has been planted also in Guatemala City, in the Jardín Botánico and Finca La Aurora, as well as elsewhere in the uplands. The tree has been introduced into cultivation at various places in South America and in the Old World tropics. Balsam is said to have been extracted from trees planted near Calcutta and in Ceylon, and the trees are reported to flourish in Kamerun, western Africa.

The tree is well known in Central America, as well as in the United States and Europe, as the source of the balsam of Peru, the *balsamum peruvianum* of commerce. This is a viscid, dark reddish brown, fragrant liquid with a warm, somewhat bitter taste; it burns readily. It is an official drug of the U. S. Pharmacopoeia, having stomachic and expectorant properties, but at present is little used in medicine. It has been much used in Europe in the manufacture of perfumes.

Two papal bulls, one issued in 1562 by Pius IV and the other in 1571 by Pius V, authorized the clergy to use the "bálsamo negro" in the preparation of the chrism, and it was declared a sacrilege to injure or destroy the trees. The balsam still is widely used in church services, especially as incense. It was an article of commerce in preconquest Mexico and doubtless in Central America. It was a regular article of tribute to the Aztec emperors. The balsam early attracted the attention of the Spaniards, and almost fantastic remedial properties were attributed to it, so that it sold in Spain at prices ranging from twenty to two hundred dollars per ounce. Much of it found its way to Europe by way of Peru, and it thus received the misleading name of Peruvian balsam.

Most of the commercial supply of the balsam is collected in a part of Salvador called the Balsam Coast, lying between the ports of La Libertad and Acajutla. Incisions are made in the trunk bark during the dry months, and the exposed areas are covered with cloths, into which the balsam flows. When the flow has ceased, it is renewed sometimes by heating the bark with torches. The cloths finally are removed and boiled in water to liquefy the resin, some of which sinks to the bottom and is collected when the water is poured off; the remainder is extracted by pressure. The liquid is further purified, then poured into tins containing about 50 pounds; it is then ready for export. The best trees are said to produce 4-5 pounds annually for many years, and the total annual amount produced is said to be about 130,000 pounds, of which almost one-half is exported to the United States.

The wood is close-grained, handsomely veined, almost the color of mahogany but redder; odor very agreeable and retained for a long time; takes an excellent polish. It is highly esteemed for cabinetwork, but little is available, since the trees are of greater value as a source of balsam.

Two *caseríos* of Guatemala have been named for the tree, El Bálsamo in Escuintla and Los Bálsamos in Suchitepéquez. The dry fruits, often much discolored and broken, are offered commonly in the Guatemalan markets for medicinal use. They are used particularly in treatment of *sarna* (itch), for which they are claimed to be the best remedy. In the Cobán region the seeds are added to *aguardiente* (presumably crude rum), to which they are said to impart a delicious flavor.

This tree was once reported from Guatemala as *Sophora tomentosa* L., on the basis of *Heyde & Lux* 6326 from Santa Lucía, Escuintla.

NISSOLIA Jacquin

Scandent or trailing herbs or slender shrubs; leaves odd-pinnate, the leaflets few, entire, not stipellate; stipules setaceous; flowers small, yellow, in axillary racemes or fascicles; bracts subulate; bractlets none; calyx denticulate or truncate and with remote, linear or filiform teeth; standard ovate-orbicular, short-unguiculate, reflexed, the wings falcate-oblong, the keel incurved, obtuse; vexillar stamen free at the base, connate at the middle with the others, the anthers subreniform; ovary sessile, few-ovulate; legume indehiscent, linear or spatulate, articulate, the joints few, compressed or convex, oblong or quadrate, the terminal one samaroid and expanded into a broad, obliquely obovate wing.

Perhaps 10 species, mostly Mexican, one or two extending southward into South America, as far as Peru. Only the following are known from Central America.

Calyx with remote minute deltoid teeth *N. fruticosa*.
Calyx with remote filiform-subulate teeth *N. guatemalensis*.

Nissolia fruticosa Jacq. Enum. Pl. Carib. 27. 1860. *N. Nelsoni* Rose, Contr. U. S. Nat. Herb. 5: 162. f. 26. 1899. *Machaerium verapazense* Donn. Smith, Bot. Gaz. 40: 2. 1905 (type from Cubilgüitz, Alta Verapaz, *Tuerckheim* 8508). *Chipilín de montaña*; *Chapernillo*.

Dry to wet thickets or sometimes in forest, frequently in rocky places, 1,800 meters or less; Alta Verapaz; Baja Verapaz; Izabal; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Guatemala; Chimaltenango; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos. Southern Mexico; Honduras; Nicaragua; Costa Rica; southward to Peru.

Usually a small woody vine, the slender stems pubescent or glabrate; leaflets 5, elliptic or oval, 2.5–7 cm. long, thin, rounded to acute or short-acuminate at the apex, rounded to cuneate at the base; glabrous above, puberulent or short-pilose beneath; flowers yellow or greenish yellow, 6–7 mm. long, in very dense, axillary, short-pedunculate racemes equaling or sometimes longer than the leaves; calyx campanulate, 1 mm. long or slightly larger, densely pubescent; standard densely pubescent outside; legume stipitate, 1–3-articulate, densely pubescent at first, glabrate in age, the joints costate, the terminal one rounded to subacute at the apex, 2–3 cm. long, reticulate-veined, thick, with somewhat thickened margins.

The Maya name of Yucatan is reported as “candul” or “can-aaul”; “hierba de tamagás” (Salvador). In Salvador the plant is sometimes used in treatment of snake bites, although it can scarcely be of any value for the purpose. The vine is common in many parts of Guatemala, but it is inconspicuous and little noticed.

Nissolia guatemalensis Rose, Contr. U. S. Nat. Herb. 5: 162. 1899.

Moist or dry thickets, 900 meters or less; Santa Rosa; Escuintla (type collected near Escuintla, *Sutton Hayes* in 1860). Western Mexico.

A woody vine, the young branches sparsely puberulent; leaflets 5, petiolulate, elliptic or oblong-ovate, 3-7 cm. long, obtuse or subacute, mucronate, rounded at the base, glabrous above, pale and puberulent beneath; racemes dense, equaling or shorter than the leaves; calyx 2 mm. long, puberulent, the teeth remote, linear-subulate, shorter than the tube; flowers greenish yellow, 6 mm. long, the standard sericeous outside; legume slender-stipitate, 3.5 cm. long, the wing acute.

It is questionable whether this is really distinct from *N. fruticosa*, and more material is needed to determine its status.

ORMOSIA Jackson

Trees; leaves odd-pinnate, the leaflets coriaceous, the stipels minute or none; stipules small and inconspicuous; flowers white to lilac or purple, in terminal panicles or rarely in axillary racemes or panicles; bracts and bractlets small or minute, linear; upper 2 calyx lobes subconnate, usually broader and incurved; standard suborbicular, the wings oblique, oval-oblong; keel petals similar to the others, more incurved, free; stamens free, unequal, all perfect or 1-2 without anthers, the anthers versatile; ovary subsessile, 2-many-ovulate, the style filiform, involute at the apex, the stigma introrse, lateral; legume oblong or rarely elongate, compressed or turgid about the seeds, coriaceous or ligneous, 2-valvate, continuous or septate within; seeds obovate or oblong, thick, lustrous, scarlet or bicolored.

About 25 species, in tropical America and Asia. One other species occurs in Panama.

Leaflets densely tomentose beneath; branches and petioles densely fulvous-tomentose with coarse spreading hairs.....*O. Schippii*.

Leaflets soon glabrate beneath; branches and petioles glabrate or thinly sericeous with minute whitish hairs.

Leaflets abruptly short-acuminate or cuspidate; valves of the legume not thickened on the margins.....*O. isthmensis*.

Leaflets gradually narrowed to an obtuse apex; valves of the legume with much thickened margins.....*O. toledana*.

Ormosia isthmensis Standl. Field Mus. Bot. 17: 264. 1937. *Acuté* (Alta Verapaz).

Wet forest, 1,200 meters or less; Alta Verapaz; Izabal. Southern Mexico (type from Ubero, Oaxaca); British Honduras; Atlantic coast of Honduras.

A tall tree of 20-27 meters, the trunk 60 cm. or more in diameter, sometimes with small buttresses, the crown spreading or rounded, the bark light brown or grayish, rather smooth but with numerous small excrescences, the young branchlets minutely sericeous or puberulent with grayish or ochraceous hairs; leaflets 7-9, coriaceous, petiolulate, obovate-oblong to elliptic-oblong, 8-12 cm. long, 4-6 cm.

wide, rounded or obtuse at the apex and abruptly cuspidate-acuminate, rounded or obtuse at the base, glabrous above, the costa and nerves impressed, beneath minutely sericeous or tomentulose at first but soon glabrate, the nerves about 11 pairs; inflorescence cymose-paniculate, large, the flowers said to be white and pink-purple; legume 2-2.5 cm. wide, sessile but somewhat constricted at the base, 5 cm. long or shorter, rounded and apiculate at the apex, castaneous, almost glabrous, the margins of the valves rounded and not at all thickened; seeds 1-2, subcompressed, subquadrate, almost 1 cm. long, bright scarlet.

Called "hormigo" in British Honduras; "colorín" (Oaxaca). In Mexico the wood is used for ax handles, railroad ties, house-posts, and general construction.

***Ormosia Schippii* Pierce in herb., sp. nov.**

Moist or wet, mixed forest, at or near sea level, British Honduras; type from Temash River, *W. A. Schipp* 1297 (type in Herb. Chicago Nat. Hist. Mus.); also Mullins River Road, *Schipp* 132.

A tree of 12-15 meters, the trunk 20-30 cm. in diameter, the stout branchlets densely fulvous-tomentose with coarse spreading hairs; leaves large, the leaflets 7, broadly oblong to oblong-obovate, 9-15 cm. long, 4-9 cm. wide, acute or abruptly short-acuminate, obtuse or rounded at the base, coriaceous, revolute-margined, glabrate above, the costa and nerves impressed, densely fulvous-tomentose beneath, the lateral nerves about 10 pairs; flowers 1.5 cm. long, in large terminal panicles, dark purple, on recurved pedicels; calyx 8 mm. long, densely ochraceous-tomentose; petals glabrous, the standard 1.5 cm. long; legume 1-3-seeded, 2 cm. wide, very densely and softly brown-tomentose; seeds scarlet and black, quadrate-ovate, little compressed, 1 cm. long.

Arbor alta, ramulis crassis dense pilis patentibus fulvo-tomentosis; foliola 7, late oblonga usque oblongo-obovata, acuta vel subito breviter acuminata, basi obtusa vel rotundata, coriacea, marginibus revolutis, supra glabrata, subtus dense fulvo-tomentosa; calyx 8 mm. longus dense ochraceo-tomentosus; petala glabra, vexillo 1.5 cm. longo; legumen dense molliterque brunneo-tomentosum, seminibus 1-3 coccineis et nigris, quadrato-ovalibus, 1 cm. longis.

This has been reported from British Honduras as *O. coarctata* Jacks., a South American species.

***Ormosia toledoana* Standl. Carnegie Inst. Wash. Publ. 461: 64. 1935.**

British Honduras, the type from Forest Home, Toledo, 60 meters, *W. A. Schipp* 1052; Veracruz; Panama.

A tree of 12-23 meters, the trunk 35-60 cm. in diameter, sometimes with small buttresses, the bark light yellowish brown, moderately smooth; young branches sparsely whitish-sericeous, soon glabrate; leaflets about 7, long-petiolulate, oblong or ovate-oblong, 6-12 cm. long, 3-4.5 cm. wide, somewhat narrowed to an obtuse apex, rounded or very obtuse at the base, glabrous or nearly so, at least in age, the veins and nerves more or less prominent on both surfaces; flowers arranged

in lax racemes in large terminal panicles, the branches densely and minutely griseous-sericeous, the pedicels 3–5 mm. long; calyx 6–8 mm. long, densely sericeous, acute at the base, the lobes acute, slightly longer than the tube; legume 1–2-seeded, castaneous or blackish, 2.5 cm. wide, constricted between the seeds, glabrous in age or nearly so, the valves ligneous, their margins much thickened and rib-like; seeds scarlet, 1 cm. long, very lustrous.

Called “colorín” in Veracruz, and known in Panama as “caci-que.” The sapwood is yellowish white, the heartwood light brown, hard, and heavy. It is used in Mexico for general construction and sometimes for canoes. The freshly cut wood is said to have the odor of pea (*Pisum*) pods.

PACHECOA Standley & Steyermark

Erect shrubs, the pubescence partly of short eglandular hairs and partly of longer, yellowish, viscid ones; stipules linear-subulate, striate-nerved; leaves odd-pinnate, the leaflets few, entire, membranaceous, mucronate, not stipellate; flowers pale orange, the peduncles axillary, rigid, mostly 2-flowered, the bracts small, lanceolate, rigid, the bractlets subulate or almost filiform, denticulate; calyx attenuate at the base and stipe-like, deeply 5-lobate, the lobes lance-attenuate, 4 of them subequal, the lowest slightly longer and narrower; standard suborbicular, unguiculate, pilose outside, the wings obliquely obovate, the keel incurved, obtuse; stamens connate to form a tube, the anthers uniform, oval; ovary sessile, few-ovulate, the style elongate, the stigma minute, terminal; legume linear-oblong, subtetragonous, the margins straight, the joints quadrate, densely short-pilose.

The genus consists of a single species. It was named for Don Mariano Pacheco Herrarte, Director General of Agriculture of Guatemala, who for many years labored diligently and with appreciable success to improve agricultural conditions of the country. His celebrated garden, with its large and varied collection of orchids, bromeliads, and many other plants, is one of the most interesting and unusual sights of the many afforded by Guatemala City.

Pachecoa prismatica (Sessé & Moc.) Standl. & Schub. in Schubert, Contr. Gray Herb. 161: 24. pls. 1, 2. 1946. *Hedysarum prismaticum* Sessé & Moc. Pl. Nov. Hisp. 124. 1889. *P. guatemalensis* Standl. & Steyermark. Field Mus. Bot. 23: 13. 1943.

Damp or dry hillside thickets, about 850 meters; Jutiapa (type collected at Jutiapa, *Standley* 75307). Southern Mexico (locality unknown).

A rather stiff shrub 2–3 meters high, the branches striate, densely pilose and sparsely viscid-setulose with long spreading yellowish hairs; stipules persistent, appressed-pilosulous, 5–8 mm. long; leaves small, short-petiolate; leaflets usually

3-5, alternate, short-petiolulate, broadly elliptic or oval, 13-25 mm. long, 7-14 mm. wide, rounded and mucronate at the apex, obtuse or rounded at the base, green above, pilose and sparsely setulose, densely pilose beneath with whitish, subappressed, rather lax hairs; peduncles equaling or shorter than the leaves, pilose and setulose; calyx 8 mm. long, pale green, appressed-pilose and sparsely setulose above the middle, the lobes almost as long as the tube, narrow, attenuate, setose-ciliate; petals pale orange, the standard 15 mm. long, densely pilose outside; legume 1.5 cm. long, with an apical beak 4-5 mm. long, 3-4 mm. wide, sessile, densely short-pilose with non-viscid hairs.

The plant grows plentifully and often forms stands of some considerable extent on hillsides at the northeast edge of the town of Jutiapa. The genus is most closely related to *Chapmannia* Torr. & Gray, whose single species is confined to Florida.

PACHYRRHIZUS L. Richard

Reference: Robert T. Clausen, A botanical study of the yam beans (*Pachyrrhizus*), Cornell Univ. Agr. Expt. Sta. Mem. 264, pp. 1-38. f. 1-13. 1944.

Herbaceous vines; leaves pinnately 3-foliolate, stipellate, the leaflets often angulate, lobate, or coarsely dentate; flowers rather large, purple, pink, or white, fasciculate-racemose, the racemes short or elongate, pedunculate, axillary, the nodes more or less thickened; bracts and bractlets small, setaceous, caducous; upper 2 calyx lobes connate to form one 2-dentate lobe; standard broadly obovate, with inflexed auricles at the base, the wings falcate-oblong; keel incurved, obtuse, equaling the wings; vexillar stamen free, the others connate, the anthers uniform; ovary subsessile, many-ovulate, the style rather stout, subinvolute at the apex, complanate, introrsely pilose, the stigma globose; legume linear, compressed, transversely depressed between the seeds; seeds ovate or compressed-orbicular, the hilum small, not strophiolate.

Six species, all American, ranging from Mexico to Bolivia and Argentina. One other Central American species has been described from Panama.

Flowers about 20 mm. (15-23 mm.) long; auricle of the wing petals equaling or more than half as long as the claw; terminal leaflet usually broader than long, either prominently or obscurely dentate or palmate-lobate, rarely entire, if lobate the lobes constricted below and widest toward the apex . . . *P. erosus*.
Flowers about 16 mm. long or shorter (8-18 mm.); auricle of the wing petals half as long or less than half as long as the claw; terminal leaflet usually as long as broad, strongly or obscurely palmate-lobate or rarely entire . . . *P. vernalis*.

Pachyrrhizus erosus (L.) Urban, Symb. Antill. 4: 311. 1905.
Dolichos erosus L. Sp. Pl. 726. 1753. *P. angulatus* L. Rich. in DC. Prodr. 2: 402. 1825. *Jicama*; *Jícamo*; *Caxilxhicam* (Petén, Maya, fide Lundell).

Cultivated occasionally in Guatemala for its edible roots, and sometimes found wild, perhaps at least in part as an escape from cultivation, growing wild in moist thickets or sometimes in pine forest, 1,875 meters or lower; Petén (probably only in cultivation); Baja Verapaz; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Guatemala; Suchitepéquez; Retalhuleu; Quiché. Mexico; British Honduras (probably only in cultivation); Salvador (cultivated very commonly) and Honduras to Costa Rica; cultivated in many tropical regions of the earth.

Usually a small herbaceous vine, trailing or climbing, finely or coarsely strigose or hirsute with tawny hairs; stipules linear-lanceolate, 5-11 mm. long; leaflets finely strigose, only sparsely so beneath, the lateral leaflets ovate or rhomboidal, entire, dentate, or palmate-lobate; terminal leaflet rhomboidal to ovate-reniform, acuminate, broadly or narrowly cuneate at the base, obscurely dentate, coarsely dentate, or 5-lobate, 4-18 cm. long and 4-20 cm. wide; racemes erect, 4-70 cm. long, the pedicels 1-5 mm. long, clustered at the nodes of the rachis, the flowers 15-23 mm. long; calyx 8-12 mm. long; standard 17-22 mm. long and 12-20 mm. wide, deep violet to white; legume 7.5-13 cm. long, 11-18 mm. wide, finely strigose, becoming glabrate, abruptly acuminate; seeds square or rounded, usually somewhat compressed, 5-11 mm. long and equally wide, yellow, brown, or red.

The form of this species with leaflets not lobed but either coarsely dentate or almost entire is var. *typicus* Clausen (Cornell Univ. Agr. Expt. Sta. Mem. 264: 13. 1944); the other, in which the leaflets are palmate-lobate, is var. *palmatilobus* (DC.) Clausen (loc. cit.). Both occur in Guatemala. The name "jicama" is of Nahuatl derivation, and is used throughout Central America and Mexico. Sometimes called "frijol papa" in Honduras; "chicam," "mechenchicam" (Yucatan, Maya). The *jicama* is a popular vegetable in Salvador and elsewhere along the Pacific slope of Central America, also in Mexico, but it is little or not at all known in central and western Guatemala. It is grown, however, in Chiquimula and Jutiapa and other departments of the Oriente, and the roots are seen occasionally in the markets there. They are always eaten raw. They somewhat resemble turnips in size and shape, but are usually rather narrower and whitish. The flesh is white, watery, sweet, and agreeable in flavor. The plants are propagated more or less like sweet potatoes, without support for the vines, and often in elevated ridges or beds. In Mexico *jicamas* often are pickled with vinegar. There is a belief there that the roots are rather unwholesome, and nursing women are cautioned against eating them for fear of injury to the child, but the seeds are said to be cooked and eaten. In some regions there is a belief that the wild plants are poisonous and, so far as we know, their roots are not eaten. The seeds have long been used in Mexico

for destroying head lice, and they have been investigated as a source of possible insecticides for the destruction of lice that infest cattle and other animals. It has been found recently that they contain rotenone, a substance found in various legumes, notably *Derris*. A bibliography covering the subject may be found in the Clausen monograph cited above.

***Pachyrrhizus vernalis* Clausen, Cornell Univ. Agr. Expt. Sta. Mem. 264: 23. f. 8. 1944. *Jicama*.**

Moist or wet thickets or open forest, often in pine forest, 1,400 meters or lower; Petén; Alta Verapaz; Izabal (type collected in pine forest between Milla 49.5 and ridge 6 miles from Izabal, Sierra del Mico, *Steyermark* 38553). Southern Mexico; British Honduras; Honduras; Costa Rica; Panama.

A small or large vine with tuberous but usually narrow roots, the stems often rooting at the nodes and prostrate or procumbent, herbaceous or suffrutescent, glabrous or sparsely strigose; stipules ovate-lanceolate, 1-2 mm. long; leaflets sparsely strigose or almost glabrous, the lateral ones rhomboidal, ovate to lanceolate, entire or 3-lobate; terminal leaflet narrowly or broadly rhomboidal, rarely linear-oblong, entire or 3-lobate, 4-16 cm. long; racemes 3-38 cm. long, the pedicels 1-5 mm. long, the flowers 12-15 mm. long; calyx 7-8 mm. long, strigose with fulvous hairs; corolla 12-15 mm. long, the standard suborbicular, emarginate, 12-14 mm. long, short-auriculate at the base, violaceous; legume 5-11 cm. long, 1.5-3 cm. wide, strigose; seeds quadrate or rounded, compressed, 6-9 mm. long, purple or fuscous.

Of this species Clausen recognizes four varieties, which he separates as follows:

Terminal leaflet 3-lobate.

Lobes of the leaflets more than 1.5 cm. wide. *P. vernalis* var. *typicus*.

Lobes of the leaflets 1.5 cm. wide or narrower. *P. vernalis* var. *angustilobatus*.

Terminal leaflet not lobate.

Terminal leaflet rhomboidal, ovate, or lanceolate. *P. vernalis* var. *integrifolius*.

Terminal leaflet linear-oblong. *P. vernalis* var. *linearifolius*.

***Pachyrrhizus vernalis* var. *typicus* Clausen, Cornell Univ. Agr. Expt. Sta. Mem. 264: 27. 1944.**

This is the commonest variety and is found throughout the area occupied by the species. It is a wild plant whose roots are never used for food, so far as known.

***Pachyrrhizus vernalis* var. *angustilobatus* Clausen, Cornell Univ. Agr. Expt. Sta. Mem. 264: 27. 1944.**

The type is from Maskall Pine Ridge, British Honduras, *P. H. Gentile* 1047. It has been collected in Alta Verapaz and Izabal, also in Panama.

Pachyrrhizus vernalis* var. *integrifolius (Donn. Smith) Clausen, Cornell Univ. Agr. Expt. Sta. 264: 27. 1944. *P. angulatus* var. *integrifolius* Donn. Smith, Bot. Gaz. 46: 110. 1910.

The type is from Cobán, Alta Verapaz, *Tuerckheim* II.1671; collected also near Los Amates, Izabal.

Pachyrrhizus vernalis* var. *linearifoliolus Clausen, Cornell Univ. Agr. Expt. Sta. Mem. 264: 27. 1944.

Known only from the type, mountain pine ridge, El Cayo District, British Honduras, *H. H. Bartlett* 11644.

PHASEOLUS L. Bean

References: C. V. Piper, Studies in American Phaseolineae, Contr. U. S. Nat. Herb. 22: 663-701. 1926; E. Hassler, Revisio specierum austro-americanarum generis *Phaseoli* L., Candollea 1: 417-472. 1923.

Mostly twining herbs, annual or perennial, sometimes with tuberous roots, rarely somewhat frutescent, sometimes prostrate or erect; leaves pinnately 3-foliate, stipellate; stipules persistent, striate; flowers small or large, white, yellow, red, or purple, fasciculate-racemose along the upper part of the peduncle, the nodes of the rachis enlarged; bracts mostly caducous, stipuliform or minute; bractlets usually broader, sometimes long-persistent; upper 2 calyx lobes or teeth connate or free; standard orbicular, recurved-spreading or somewhat twisted, the margins inflexed at the base; wings usually obovate, equaling or longer than the standard; keel linear or obovate, the beak long and obtuse, usually spirally twisted or coiled; vexillar stamen free, the others connate, the anthers uniform; ovary subsessile, with few or numerous ovules; style twisted with the keel, usually longitudinally barbate above, the stigma oblique; legume linear or falcate, subterete or compressed, 2-valvate; seeds thick or compressed, the hilum small or linear, not strophiolate.

Probably 100 species or more, in warmer regions of both hemispheres, mostly in the tropics. A few additional species have been recorded from other parts of Central America. Economically this is one of the most important groups of plants of the world, and especially of Central America. As food in Guatemala, beans are second in importance only to maize. While much has been published upon the taxonomy of *Phaseolus*, there is no recent monograph of the group, except for the one cited above for South America, which

is far from being satisfactory. Piper did much to elucidate the species, but his work is fragmentary as far as Central American species are concerned, and he published no comprehensive key to the species. The genus is seriously in need of critical revision, which its economic importance certainly justifies. Many of the species are difficult of separation, but probably their characters would be better understood if more specimens were available for study.

Stipules produced at the base below the point of insertion; flowers yellow.

Leaflets very densely soft-pilose, mostly obtuse, often shallowly lobate; native plants. *P. pilosus*.

Leaflets glabrate, acute to acuminate, entire; cultivated plants. . . *P. calcaratus*.

Stipules not produced at the base; flowers not yellow.

Calyx subtubular, narrow, longer than broad, usually or always 5-dentate, the upper teeth not united; flowers dark purple to almost black; leaflets often linear or nearly so; legume narrowly linear. Subgenus *Macroptilium*.

Calyx teeth unequal, the lower ones almost or quite as long as the tube; leaflets densely pilose beneath. *P. atropurpureus*.

Calyx teeth subequal, all much shorter than the tube; leaflets glabrous beneath or densely pilose.

Leaflets densely soft-pilose beneath. *P. scolecocarpus*.

Leaflets glabrous beneath or nearly so.

Leaflets all linear or nearly so, with elevated reticulate venation; plants usually twining, perennial. *P. gracilis*.

Leaflets mostly suborbicular to elliptic, sometimes linear-oblong, the venation neither elevated nor conspicuously reticulate; plants not twining, annual. *P. lathyroides*.

Calyx broadly campanulate, usually as broad as long, the 2 upper teeth commonly united to form a single one.

Keel of the corolla loosely curved like the letter S, or sometimes scythe-shaped.

Keel of the corolla scythe-shaped, not forming a complete coil. Subgenus *Ramirezella*. *P. Buseri*.

Keel of the corolla loosely S-shaped. Subgenus *Sigmoidotropis*.

Leaflets densely pubescent beneath. *P. speciosus*.

Leaflets glabrous beneath or sparsely strigillose.

Flowers 2 cm. long or shorter; leaflets glabrous beneath.

P. peduncularis.

Flowers 3 cm. long or even larger.

Leaflets glabrous. *P. elegans*.

Leaflets sparsely strigillose on both surfaces. *P. pulchellus*.

Keel of the corolla closely coiled in one or more circles.

Calyx teeth subequal, equaling or longer than the tube; flowers very small, mostly about 8 mm. long; plants small, from tuberous roots. Subgenus *Microcochle*. *P. heterophyllus*.

Calyx teeth very unequal, or all of them shorter than the calyx tube; flowers usually much larger.

Lower calyx lobes much longer than the tube.

Leaflets linear or nearly so. *P. linearis.*

Leaflets lance-oblong to ovate.

Lower calyx lobes ovate or lanceolate; bracts ovate; leaflets usually densely pilose beneath *P. spectabilis.*

Lower calyx lobes linear or lance-linear; bracts lance-linear or lanceolate; leaflets only sparsely pilose beneath *P. stenolobus.*

Lower calyx lobes much shorter than the tube.

Legume usually less than 3 cm. long, rather broad; flowers small, purple, about 8 mm. long *P. anisotrichos.*

Legume always much longer; flowers usually more than 1 cm. long, often much longer.

Legume linear, not dilated upward; flowers pink, rather pale purple, or sometimes white.

Bractlets about equaling the calyx, persistent; cultivated plants, erect or twining *P. vulgaris.*

Bractlets usually much shorter than the calyx, often minute, deciduous.

Stems pilose with spreading yellow hairs; corolla about 13 mm. long *P. xanthotrichus.*

Stems glabrous or nearly so, not spreading-pilose; corolla usually 2 cm. long or larger.

Calyx lobes all obtuse or rounded at the apex, the lower ones very short and broad, much shorter than the tube.

P. Caracalla.

Calyx lobes very dissimilar, the 3 lowest narrow, usually acute, often equaling the tube *P. adenanthus.*

Legume falcate-oblong, relatively wide, broadened toward the apex.

Bractlets conspicuous, usually equaling the calyx, persistent.

Bractlets suborbicular, as broad as the calyx *P. formosus.*

Bractlets oblong or elliptic-oblong, much narrower than the calyx *P. coccineus.*

Bractlets inconspicuous, small, much shorter than the calyx, often deciduous.

Leaflets mostly linear-lanceolate to ovate-lanceolate and long-attenuate or long-acuminate *P. acutifolius.*

Leaflets mostly ovate to broadly rhombic-ovate and merely acute or even obtuse.

Leaflets densely pilose beneath; legume densely pilose.

P. Tuerckheimii.

Leaflets glabrous beneath or nearly so; legume glabrous or glabrate.

Bracts of the racemes large and covering the flower buds, somewhat persistent, 1-1.5 cm. long *P. macrolepis.*

Bracts small and inconspicuous, caducous.

Pedicels 3-4 times as long as the calyx or longer; racemes few-flowered; native plants with very slender stems.

P. viridis.

Pedicels mostly twice as long as the calyx or shorter; racemes many-flowered; cultivated or wild plants with relatively stout stems *P. lunatus.*

Phaseolus acutifolius Gray, Pl. Wright. 1: 43. 1852. *P. acutifolius* var. *tenuifolius* Gray, op. cit. 2: 33. 1853. *P. latifolius* Freeman, Bot. Gaz. 56: 412. 1913. *P. acutifolius* var. *latifolius* Freeman, Bull. Arizona Expt. Sta. 68: 589. pls. 8, 9. 1912. *Ixcomita*, *Ixcumite*; names reported also as *Escomite* and *Escumite*. *Tepary bean*.

Cultivated occasionally in the lower foothills or on the upper plains of the Pacific slope, particularly in Suchitepéquez and Retalhuleu, and doubtless also in San Marcos. Native in western or northwestern Mexico and adjacent Arizona and New Mexico, and also cultivated in the same area.

A slender annual, twining, the stems glabrate or sparsely puberulent or short-pilose with mostly recurved hairs; leaflets thin, varying from almost linear to ovate, long-acuminate to attenuate, entire, scaberulous or almost glabrous, the venation prominent and conspicuous; peduncles few-flowered, very slender, shorter than the leaves, the bracts and bractlets inconspicuous, subulate, deciduous; pedicels slender, about equaling the flowers; calyx puberulent or glabrate, 2.5–3.5 mm. long, broadly campanulate, the teeth shorter than the tube; petals white or pale purple, the standard 8–10 mm. long; legume 2–7-seeded, falcate and strongly compressed, thin, 5–9 cm. long and 8–13 mm. wide or sometimes smaller, puberulent when young, glabrate in age; seeds similar to those of *P. vulgaris* in shape or sometimes somewhat compressed as in *P. lunatus*, about 8 mm. long and 5.5 mm. broad, but variable in size, varying in color (in cultivated forms) from white to yellow, brown, bluish black, or deep violet, of uniform color or sometimes spotted.

To this species probably belongs the small, pale brownish or blackish bean known in Retalhuleu by the name "frijol de Colima." It is sold commonly in the markets about Retalhuleu, also in the Mazatenango region. The time of its introduction, for it probably is not native here, is unknown, but it may have been imported long ago from Mexico. It is reported as common in the Mexican state of Chiapas. The tepary bean has long been grown for food by the Indians of the southwestern United States and northwestern Mexico. It has the advantage of maturing quickly and of thriving in relatively arid and hot regions, and in sterile soil.

Phaseolus adenanthus G. F. W. Mey. Prim. Fl. Esseq. 239. 1818. *P. truxillensis* HBK. Nov. Gen. & Sp. 6: 451. 1824. *P. radicans* Benth. Ann. Wien. Mus. 2: 138. 1840. *P. adenanthus* var. *radicans* Hassler, Candollea 1: 443. 1923.

Wet to dry thickets, usually climbing over shrubs, 750 meters or less; Alta Verapaz; Izabal; Jutiapa; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu. Southern Mexico; British Honduras to Salvador and Panama; South America; also in the Old World tropics, where probably introduced.

A slender or rather stout, herbaceous, perennial vine, the stems puberulent or glabrous; leaflets large, broadly ovate or ovate-oblong, entire, acute or acuminate, rounded or broadly cuneate at the base, glabrous or more or less puberulent or pilose; racemes on very long peduncles, usually longer than the leaves, few-many-flowered, the rachis short or elongate, much thickened at the nodes; bractlets broadly ovate, costate-nerved, much shorter than the calyx; calyx broadly campanulate, glabrous or sparsely pubescent, the tube 4 mm. long, 4-dentate, the upper tooth broad, emarginate, the lower ones almost equaling the tube, acute or acuminate, the lateral ones falcate; flowers purple or pink, the standard suborbicular, 2.5 cm. long, the wings obovate, 3 cm. long, 1 cm. wide; keel forming 2 spirals; legume linear, almost uniform in width, often subfalcate, 7-12 cm. long, 8-10 mm. wide, strigose or short-pilose, often glabrate, the valves very convex, rostrate at the apex; seeds oval, turgid, 3-5 mm. long, brown.

Phaseolus anisotrichos Schlecht. *Linnaea* 12: 326. 1838. *P. leptostachyus* Benth. *Ann. Wien. Mus.* 2: 136. 1840. *Frijolillo*; *Frijolillo de culebra*.

Moist to dry thickets, often in pine-oak forest, sometimes a weed in corn fields, 250-2,000 meters; Zacapa; Jalapa; Santa Rosa; Guatemala; Chimaltenango; Huehuetenango. Mexico; Honduras; Costa Rica.

Usually a small, slender, much branched vine, the stems puberulent and pilose with spreading or retrorse hairs; stipules lanceolate to obovate, rather large and conspicuous; leaflets broadly ovate-deltoid, mostly 2-3 cm. long, acute or obtuse, broadly rounded at the base, hirsute-pilose on both surfaces or in age glabrate, paler beneath; racemes many-flowered, long-pedunculate, often several times as long as the leaves; bracts concealing the flower buds, broad, soon deciduous, the pedicels very short; calyx broadly campanulate, 2 mm. long, usually glabrous, the teeth shorter than the tube, obtuse; corolla 6 mm. long, purple; legume strongly compressed, rather broadly linear and falcate, broadest toward the apex, about 2 cm. long and 4 mm. wide, with 6 or fewer seeds, acute or acuminate and rostrate, narrowed to the base, sparsely or densely hirsute-pilose.

Among Guatemalan species this is easily recognized by its combination of twining stems, very small, purple flowers, and very small, reflexed, numerous, relatively broad pods.

Phaseolus atropurpureus DC. *Prodr.* 2: 395. 1825. *P. dysophyllus* Benth. *Pl. Hartweg.* 287. 1848. *Bejuco pensamiento* (Guatemala); *Chorroque de monte* (fide Aguilar).

Moist or dry thickets, usually twining over shrubs, sometimes procumbent on open banks, 1,200 meters or less; Petén; Alta Verapaz; El Progreso; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Guatemala; Quiché. Southwestern Texas; Mexico; British Honduras; Honduras; Salvador; Panama; South America.

A small or large, herbaceous vine, the rather stout stems very densely pilose with soft, whitish, mostly reflexed hairs; stipules inconspicuous, densely pilose; leaflets mostly 2–8 cm. long, suborbicular to rhombic-ovate or oblong, usually obtuse, entire or frequently with a shallow lobe on the outer side, very densely and softly pilose on both surfaces with whitish hairs; peduncles elongate, much exceeding the leaves, the racemes short and few-flowered, the bracts linear, equaling or longer than the buds, deciduous; calyx campanulate-tubular, 5 mm. long, very densely white-pilose, the 2 upper teeth triangular, acute, the 3 lower ones very acute or almost subulate, about equaling the tube or sometimes shorter; corolla black-purple, the standard 1.5–2 cm. long, long-unguiculate; legume narrowly linear, 5–9 cm. long, scarcely more than 3 mm. wide, attenuate, strigose, many-seeded.

Called "chonchito" in Salvador. From most other Central American species this is distinguished by its almost black flowers. It is highly variable in shape and pubescence of the leaflets, although the Guatemalan collections are fairly uniform.

Phaseolus Buseri Micheli, Mém. Soc. Phys. Nat. Genève 34: 262. pl. 13. 1903. *Ramirezella Buseri* Rose, Contr. U. S. Nat. Herb. 12: 274. 1909.

Moist thickets, 1,200–1,500 meters; Suchitepéquez; Quezaltenango; San Marcos. Western Mexico.

A small or large vine, somewhat woody below, the stems angulate, sparsely strigose or glabrate; stipules 2–5 mm. long, striate, obtuse; leaflets broadly ovate or ovate, often somewhat oblique, acuminate to narrowly long-acuminate, rounded at the base, almost glabrous, thin; inflorescences mostly longer than the leaves, generally dense and many-flowered, short-pedunculate, the rachis thick; pedicels 2–3 times as long as the calyx; primary bracts 10–12 mm. long, multistriate, broadly ovate, very obtuse; bractlets small, much shorter than the calyx, 3-nerved; calyx broadly campanulate, 5–6 mm. long, glabrous or nearly so, the teeth very broad and obtuse, less than half as long as the tube; corolla 1.5–2 cm. long, lavender or violet; legume turgid and almost terete, long-rostrate, strigose or glabrate.

For an account of the generic status of *Ramirezella* Rose see C. V. Morton, Contr. U. S. Nat. Herb. 29: 84. 1944. As he remarks, the genus was based upon an "arbitrary and often nonexistent distinction," but was treated as distinct by C. V. Piper, who was usually rather conservative. The group has perhaps as much claim to generic rank as some other genera generally recognized in the Phaseoleae, which is to say that its claims are not very good. Piper described a *Ramirezella ornata*, based upon a plant cultivated in Salvador, but the Guatemalan material does not agree well with the description of that. The nomenclature of the species that have been referred to *Ramirezella* or described as new under that name is much confused, in spite of the account of that genus published by

Piper (Contr. U. S. Nat. Herb. 22: 669. 1926). Piper recognized eight species, but remarked that six of them were very closely related, a mild statement of the case. The name *P. Buseri* is used here, although with some reservations, because it is the oldest name in the group, except for one applied to a probably distinct species of northwestern Mexico.

Phaseolus calcaratus Roxb. Hort. Beng. 54. 1814, nomen nudum; Fl. Ind. ed. 2. 3: 289. 1832. *Frijol arroz*. *Rice bean*.

Native of southeastern Asia and the East Indies, often cultivated in other tropical regions. Planted for its edible seeds in the lower portions of the Pacific slope of Guatemala, especially in Retalhuleu, Quezaltenango, and San Marcos, at Salamá (Baja Verapaz), and possibly elsewhere.

A small or rather large, herbaceous vine, annual or perennial, the stems hirsute or pilose with long, spreading, fulvous or brownish hairs; stipules acuminate, 1-1.5 cm. long, produced below the point of insertion, costate-nerved; leaflets broadly rhombic-ovate or sometimes lance-oblong, 5-8 cm. long, 3-5 cm. wide, sparsely hirsute or glabrate, entire, acute or acuminate; peduncles axillary, short or elongate, the racemes usually 4-5 cm. long, spike-like, the bracts linear, 4-5 mm. long; pedicels 2-3 mm. long; calyx 4-5 mm. long, almost glabrous, the lower teeth triangular, acute; petals yellow, 1 cm. long; legume linear and somewhat falcate, 6-8 cm. long, 5-6 mm. wide, slightly torulose, glabrous; seeds 8-12, cylindric, 6 mm. long, brownish red, lustrous, with a large white linear hilum 3.5 mm. long.

Many surprising discoveries can be made among the native and introduced food plants of Guatemala, some of these being confined, apparently, to limited areas of the country, and quite unknown in other parts. Of such plants the rice bean is a good example. It was observed by the senior author in the market at Coatepeque (Quezaltenango), and several persons stated that it was planted at various places along the foothills of the Occidente, but it is not at all common. There are at hand specimens taken from cultivation in Costa Rica (Cachí), but the plant is little known in other parts of Central America, and planted there perhaps only experimentally. The beans were found to be very good to eat, with a flavor quite different from that of *P. vulgaris*. The seeds are distinctive in appearance, and quite different from the ordinary *frijol*. They strongly suggest by their size and shape grains of rice, hence the Spanish and English common names. Their most distinctive character, besides their small size, cylindric shape, and brownish red color, is the pure white, long, and conspicuous linear hilum.

Phaseolus Caracalla L. Sp. Pl. 725. 1753.

Moist or wet thickets, 1,750 meters or less; Suchitepéquez; Retalhuleu; Quezaltenango; Huehuetenango. Mexico; tropical South America; often grown for ornament in other regions.

A slender vine, sometimes suffrutescent below, the stems at first sparsely appressed-pilose or glabrous; stipules striate, 4 mm. long; leaflets thin, broadly ovate or deltoid-ovate, rather large, acute to long-acuminate, rounded or broadly cuneate at the base, glabrous or nearly so; peduncles axillary, 5–20 cm. long, the flowers few or numerous, the pedicels 5–6 mm. long; bracts ovate, striate, deciduous; bractlets ovate, striate, 2–2.5 mm. long; calyx broadly campanulate, rounded at the base, 13 mm. long or less, the tube glabrous, the 4 lobes obtusely rounded, much shorter than the tube; corolla pale purple or lavender, the standard as much as 5 cm. long but usually shorter; keel twisted into 4–5 spirals; legume linear, subterete, 18 cm. long or shorter, as much as 13 mm. wide, glabrous; seeds about 16, subglobose, 7–8 mm. in diameter, the hilum scarcely 2 mm. long, the surface castaneous, lustrous.

Called “choncho” in Salvador.

Phaseolus coccineus L. Sp. Pl. 724. 1753. *P. multiflorus* Willd. Sp. Pl. 3: 1030. 1810. *Piloy*; *Nima kinac* (Quiché); *Lool* (Cobán, Quechí); *Ixcumite* (San Marcos); *Frijol num* (Cobán); *Frijol chamborote*, *Chamborote* (Huehuetenango).

Moist or wet thickets, often on borders of forest, sometimes growing more or less as a weed in old fields, 1,000–2,500 meters; cultivated for its seeds in the mountain regions; Alta Verapaz; Zacapa; Jalapa; Jutiapa; Santa Rosa; Escuintla; Sacatepéquez; Chimaltenango; Sololá; Suchitepéquez; Huehuetenango. Southern Mexico; Honduras; Costa Rica; Panama; cultivated in South America.

A small or large, herbaceous vine, the stems sparsely or rather densely short-pilose with spreading or reflexed hairs, sometimes glabrate, the root sometimes large and tuberous but the plant treated as an annual when cultivated; stipules small and inconspicuous; leaflets large, thin, deltoid-ovate to very broadly rhombic or rhombic-orbicular, often broader than long, acuminate to subobtusely, copiously pilose or villous on both surfaces or glabrate, bright green; peduncles elongate, much exceeding the leaves, the flowers very numerous, scarlet (rarely white, but not so observed in Guatemala), forming a lax or dense raceme, the pedicels long and slender, glabrous or pilose; bracts oblong-lanceolate, often equaling the pedicels, more or less persistent; bractlets oblong-lanceolate, equaling or longer than the calyx; calyx broadly campanulate, glabrous or sparsely pilose, the teeth much shorter than the tube, the lower ones triangular, subacute; petals 1.5–2 cm. long; legume compressed, falcate-oblong, 5–7 cm. long and 1.5 cm. wide or often much larger, scabrous or glabrous; seeds 5 or often more, compressed, resembling those of *P. lunatus*, brown, black, red, or white.

Called “chilipuca” in Salvador and “cubá” or “cubaces” in Costa Rica. Reported from Guatemala as *P. obvallatus* Schlecht.

This is one of the very common beans of the central mountains of Guatemala, both green and dry seeds being used in large amounts for food. The seeds closely resemble those of *P. lunatus* in shape, size, and coloring, but they have a slightly different flavor when cooked. The plants are quite different from those of *P. lunatus*, especially in their scarlet flowers, which are beautiful and very showy. Apparently the vines flower for only a short time, at the end of the rainy season. This species sometimes is cultivated for ornament in the United States under the name "scarlet runner bean." The seeds vary considerably in shape, and while usually they are compressed and broad, they are sometimes subterete, although much broader than those of *P. vulgaris*. The color varieties are unlimited in number, and apparently no distinction is made between them, since the beans offered in a single lot for sale often exhibit dozens of varieties, not being separated as is usual in the case of *P. vulgaris*. The name "juruna" is reported from Guatemala as referring to a black bean similar to the "piloy." The name "ixtapacal" is sometimes applied to this species, although that name is believed to belong more properly to *P. lunatus*. In the latter the beans have numerous lines radiating from the hilum or "eye," while in *P. coccineus* such lines are absent or very faint. The beans cultivated about Antigua with the name "piligua" seem to belong to *P. coccineus*.

This bean is little grown in the United States for food, although it is planted on a small scale in the Southwest, especially by the Indians, who probably obtained the seeds long ago through traders coming from Mexico. In Costa Rica *cubaces* are much used for food, especially in the region of Santa María de Dota, where they almost wholly replace the *frijol negro* of other parts of the country.

***Phaseolus elegans* Piper, Contr. U. S. Nat. Herb. 22: 674. 1926.**

Moist or wet thickets, 350 meters or less; Alta Verapaz (Cubilgüitz, *Steiermark* 44395); British Honduras; to be expected in Petén. Yucatan Peninsula of Mexico; Honduras; Jamaica.

A large herbaceous vine, sometimes perhaps suffrutescent, the stems glabrous; stipules narrowly triangular, acute, 4 mm. long, 7-nerved; leaflets thin, elliptic-ovate, rhombic-ovate, or deltoid-ovate, acute or acuminate, rounded at the base, 4-7 cm. long, glabrous; peduncles usually much longer than the leaves, with few flowers close together near the apex, the rachis very nodose; calyx broadly campanulate, glabrous or nearly so, 6 mm. long, the upper lip short, emarginate, the lower lobes about equaling the tube, broadly lanceolate, acute; corolla bright purple, 2-3 cm. long, the keel tubular, sigmoid; legume linear, straight or nearly so, 10-16 cm. long, 5 mm. wide, strongly compressed, long-rostrate, glabrous;

seeds ellipsoid, numerous, compressed, ochraceous speckled with black, 5 mm. long, 3 mm. broad, the hilum small, white, with a black border.

The Maya name in Yucatan is "cantzin."

Phaseolus falcatus Benth. ex Hemsl. Biol. Centr. Amer. 1: 304. 1880, nomen nudum. Based in part upon a collection made by Salvin at Dueñas, base of Volcán de Fuego, Sacatepéquez. The name seems not to have appeared elsewhere in literature, and we have no idea of the species to which it was intended to apply.

Phaseolus formosus HBK. Nov. Gen. & Sp. 6: 449. 1824.

Moist thickets, 1,300–1,500 meters; Jalapa; reported by Piper as collected at Santiago, Dept. Guatemala. Mexico; probably also in Costa Rica.

Usually a rather large, herbaceous vine, from a large fleshy root, the stems sparsely hirsute or almost glabrous; stipules lance-oblong, small, striate, ciliate; leaflets usually thin and bright green, deltoid-ovate or elliptic-ovate, sometimes almost rounded, acute to long-acuminate, rounded or broadly cuneate at the base, scaberulous or hirtellous above, hirtellous or often densely short-pilose beneath, sometimes glabrate; racemes longer than the leaves, the flowers in a short dense many-flowered raceme, the pedicels long and slender, glabrous to densely short-pilose, the bracts linear to lance-ovate, large and conspicuous, rather long-persistent; bractlets oval or suborbicular, as long and broad as the calyx, green, obtuse; calyx very broadly campanulate, about 4 mm. long, glabrous or strigose, the lower teeth very short and broad; petals scarlet or red-purple, 1.5–2 cm. long; legume broadly falcate, strongly compressed, acute and rostrate, attenuate to the base, hirsute or glabrate.

Phaseolus gracilis Poepp. ex Benth. Ann. Wien. Mus. 2: 141. 1840. *P. longipedunculatus* Mart. ex Poepp. loc. cit. *P. longipedunculatus* var. *linearifoliolatus* Hassler, Candollea 1: 453. 1923 (type from Alta Verapaz, *Tuerckheim* 3573). *Frijolillo*; *Flor de la reina*.

Grassy savannas, 1,200 meters or lower; Petén; Alta Verapaz. Southern Mexico; British Honduras; Nicaragua to Panama; South America.

A slender perennial from a woody root, the stems erect to procumbent, short, sometimes twining about small herbs, strigose or glabrate; stipules linear or lanceolate, 4 mm. long or shorter; leaflets linear or oblong-linear, coriaceous, usually entire, obtuse, sparsely or densely pilose, sometimes glabrate, the venation elevated and conspicuous, 2–5 cm. long; peduncles much exceeding the leaves, the flowers few, in a short raceme, the bracts and bractlets subulate; calyx tubular-campanulate, 4 mm. long, the teeth subulate, much shorter than the tube; petals red-purple or brick-red, the standard 1.5 cm. long, the keel forming one complete spiral;

legume linear, 5-6 cm. long, 2-3 mm. wide, acuminate, strigose; seeds oblong, lustrous, 2 mm. long.

A characteristic savanna plant. Hassler considered the Central American plant (from Guatemala and Costa Rica) a distinct variety of the species, leaflets in South American plants being lanceolate or lance-oblong.

Phaseolus heterophyllus Willd. Enum. Pl. Hort. Berol. 2: 753. 1809. *Jicamo silvestre*.

Open grassland, 1,500-2,200 meters; Guatemala; Chimaltenango; Huehuetenango. Southwestern United States; Mexico; Honduras.

A small perennial, from a fleshy turnip-shaped root 1.5-3.5 cm. in diameter, the stems slender, short, prostrate or twining, hirsute with spreading hairs; stipules small, hirsute; leaflets narrowly oblong to ovate-oblong, the lower ones often hastate-lobate, 1.5-3 cm. long, obtuse or rounded at the apex, sparsely or usually densely pilose with chiefly spreading hairs; peduncles slender, much longer than the leaves, hirsute, the racemes very short and dense; calyx 3 mm. long, densely hirsutulous, the lobes subulate, subequal, equaling or longer than the tube, erect; corolla 8 mm. long, salmon-colored or purple; legumes reflexed, narrowly oblong-falcate, about 1.5 cm. long and 2.5 mm. wide, acute or acuminate, densely short-pilose.

The roots sometimes are eaten raw, and pigs also eat them.

Phaseolus lathyroides L. Sp. Pl. ed. 2. 1018. 1763. *P. semi-erectus* L. Mant. Pl. 1: 100. 1767.

Open fields or slopes, in wet or dry places, often a weed about dwellings in tropical lowlands; Jutiapa (Lago Retana, 600 meters). Mexico; British Honduras; Panama; West Indies; South America.

An annual, usually erect, rarely somewhat twining, the stems pilose or glabrous; stipules lanceolate, 1 cm. long or less; leaflets linear-oblong to elliptic or almost rounded, 3-7 cm. long, obtuse or acute, rounded at the base, glabrous or sparsely pubescent; peduncles much exceeding the leaves, often 30 cm. long, the flowers geminate, remote upon the upper part of the rachis and rather few; bracts and bractlets subulate; calyx tubular-campanulate, 6 mm. long, the teeth short, triangular, acute; petals red-purple to almost black, the standard 1.5 cm. long; keel forming one spiral; legume narrowly linear, 8-10 cm. long, 2-3 mm. wide, strigose; seeds oval, 3 mm. long or less, scarcely compressed, brownish gray speckled with black.

Called "frijolillo de monte" in Yucatan. This plant is not common in Central America, and usually is found close to the coast, where it has the appearance of being introduced.

Phaseolus linearis HBK. Nov. Gen. & Sp. 6: 445. 1824.

In savannas, on open, grassy or brushy plains, often on rocky hillsides, 1,700 meters or less; Péten; reported from Alta Verapaz

(Cubilgüitz); Zacapa; Chiquimula. Mexico; British Honduras; Panama; South America.

A herbaceous perennial, ascending or scandent, the young stems sparsely appressed-pilose, glabrate in age; stipules ovate or lanceolate, 4 mm. long; leaflets linear or oblong-linear, 4-10 cm. long, coriaceous, obtuse or acute and mucronate, rounded at the base, glabrous or nearly so, the venation prominent and reticulate; peduncles elongate, bearing a few flowers at the apex, the pedicels 2 mm. long; calyx broadly campanulate, usually glabrous, the tube 4 mm. long, the 3 lower teeth narrow and long-acuminate, longer than the tube; corolla red-purple, the standard 2.5 cm. long; keel forming 2 spirals; legume linear, flat, 6-9 cm. long, 5 mm. wide, glabrous.

In general appearance this plant is much like *P. gracilis*, especially in foliage, but the calyces of the two species are very unlike.

Phaseolus lunatus L. Sp. Pl. 724. 1753. *Ixtapacal*; *Ixpanqué* (Retalhuleu); *Pileu* (Retalhuleu); *Frijol de media luna*; *Piloy*; *Jurón de venado* (Chiquimula fide Seler); *Frijol de monte*. *Lima bean*.

Cultivated commonly for food in the lowlands, also wild in many regions (following distribution relates only to wild plants); common in wet to dry thickets, often in roadside hedges, or a weed in waste ground, 2,100 meters or less, most common at 1,000 meters or lower; Alta Verapaz; Zacapa; El Progreso; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Suchitepéquez; Retalhuleu; San Marcos. Mexico; British Honduras to Salvador and Panama; West Indies; South America; Old World tropics, where probably naturalized.

Plants annual, herbaceous, scandent (except in some cultivated forms), the stems glabrate; stipules lanceolate, 4 mm. long; leaflets ovate to rhombic or deltoid-ovate, acute or acuminate, rounded or broadly cuneate at the base, thin, mostly 5-10 cm. long, usually glabrous or nearly so; peduncles longer than the leaves, the flowers in long or short, usually interrupted racemes; bracts and bractlets small and inconspicuous, the slender pedicels 1 cm. long or shorter; calyx campanulate, 3 mm. long, the upper tooth broad and subtruncate, the 3 lower ones short, triangular, obtuse; petals generally purplish green, the standard 1 cm. long; keel forming 2 spirals; legume falcate-oblong, the vexillar suture almost straight, the carinal suture strongly curved, glabrous or nearly so, much compressed, 5-9 cm. long, 1-2 cm. wide, 3-4-seeded; seeds reniform, usually compressed, variable in size, small on wild plants but large in cultivated forms, with numerous elevated lines radiating from the hilum.

Known sometimes in Salvador as "chilipuca" and "frijol iztagapa." The name "frijol de mantequilla" has been recorded from the Atlantic coast of Honduras, evidently the result of North American influence, and a translation of the common English name of "butter bean." In the case of the common bean, *Phaseolus vulgaris*,

no close wild relative is known, but a close relative of the lima bean, and probably the plant from which it has been derived, is very common wild through much of the lowlands of tropical America, and there can be little doubt that it is an American plant. The wild plants always have rather small pods and very small seeds, which are not eaten, so far as we know. In Guatemala the lima bean, usually called "ixtapacal," is almost confined in cultivation to the Pacific foothills or plains, and it is planted but little in the higher regions. The cultivated plants exhibit great variation in the shape, size, and color of their seeds, and apparently little attempt is made to keep the varieties separate. The dry beans sold in the markets usually have a great mixture of colors. While the dry or green seeds of the lima bean are a common article of food in the regions of Guatemala where they are planted, they are little used in other parts of the country, and in some regions, as at Cobán, they seem to be almost unknown. All the lima beans planted are of the scandent type, the bush or erect limas of the United States being unknown, except for experimental plantings.

Lima beans sometimes contain a poisonous principle, and cases of poisoning from their use have been reported. Practically all varieties, wild and cultivated, have been found to contain a principle which when acted upon by an enzyme yields hydrocyanic acid. Prolonged boiling extracts most of the poisonous property, but it is merely withdrawn and not destroyed, and if the water is absorbed it presents the same dangers as the beans themselves.

Phaseolus macrolepis Piper, Contr. U. S. Nat. Herb. 22: 698. 1926. *Frijolito*.

Moist thickets or mixed forest, sometimes in oak or pine forest, 1,500–3,000 meters; endemic; Jalapa; Sacatepéquez (type collected above Calderas, Volcán de Actenango, *Salvin*); Quezaltenango.

A slender herbaceous vine, the stems reflexed-strigose or glabrate; stipules oblong, subacute, 3–4 mm. long, 7-nerved; leaflets thin, bright green, rhombic-ovate to ovate or lance-ovate, 7–9 cm. long, long-acuminate, rounded to broadly cuneate at the base, sparsely strigillose or puberulent on both sides or almost glabrous; peduncles equaling or longer than the leaves, the racemes short, few-flowered; bracts elliptic, acuminate, faintly nerved, strigillose, about 1.5 cm. long, persistent and concealing the flower buds; pedicels puberulent, 8 mm. long, the bractlets ovate, obtuse, much shorter than the calyx; calyx broadly campanulate, 4 mm. long, puberulent, the upper tooth emarginate, the 3 lower teeth broad, obtuse, less than half as long as the tube; corolla bright purple, 2 cm. long, the keel with one complete spiral; immature legume falcate-oblong, 4 cm. long and almost 1 cm. wide, acute, rostrate, attenuate to the base, strongly compressed, glabrous.

Phaseolus peduncularis HBK. Nov. Gen. & Sp. 6: 447. 1824.

Moist or wet thickets, 1,000 meters or less; Alta Verapaz; Izabal; Zacapa; Jutiapa; Escuintla. British Honduras to Panama; South America.

Usually a small herbaceous vine, the stems twining or prostrate, puberulent, pilose, or glabrate; stipules lanceolate, 6 mm. long or less; leaflets thin, ovate to deltoid-ovate or rhombic-ovate, sometimes ovate-oblong, acute or acuminate, truncate to broadly cuneate at the base, glabrous or sparsely pilose, 5–10 cm. long; peduncles equaling or longer than the leaves, the flowers few or numerous, often crowded at the ends of the peduncles, the bracts and bractlets minute, the pedicels short; calyx broadly campanulate, 4 mm. long, the upper tooth truncate or emarginate, the 3 lower teeth triangular, acute, much shorter than the tube; petals pale purple, the standard about 1.5 cm. long, the keel sigmoid; legume linear, 4–7 cm. long, 4–5 mm. wide, sparsely strigose, compressed, many-seeded.

Phaseolus pilosus HBK. Nov. Gen. & Sp. 6: 453. 1824. *P. hirsutus* Mart. ex Benth. Ann. Mus. Wien. 2: 140. 1840.

River banks and open places, near sea level; British Honduras; Tabasco; Honduras; Costa Rica; Panama; South America.

A rather stout, herbaceous vine, the stems densely pilose with fulvous spreading hairs; stipules 6 mm. long, shortly produced at the base below the point of insertion; leaflets rhombic-ovate to oblong, entire or often shallowly trilobate, obtuse, broadly rounded or obtuse at the base, very densely sericeous-pilose on both surfaces, more densely so beneath; peduncles 10–15 cm. long, the racemes few-flowered, the bracts and bractlets subulate, deciduous; calyx campanulate, densely pilose, the tube 5 mm. long, the 2 upper teeth connate, the 3 lower teeth about as long as the tube, acute; petals yellow, the standard bilobate, 3 cm. long, the keel forming 1 complete spiral; legume linear, 5–7 cm. long, 7 mm. wide, densely brown-pilose; seeds compressed, lustrous, black, 3–4 mm. long.

Phaseolus pulchellus Piper, Contr. U. S. Nat. Herb. 22: 674. 1926.

Known only from the type, Semacoch, Alta Verapaz, *G. P. Goll* 264.

A vine, herbaceous or perhaps suffrutescent, the stems glabrous; stipules oblong, 3 mm. long; leaflets rhombic-ovate, long-acuminate, broadly cuneate at the base, sparsely strigillose on both surfaces; peduncles stout, 10 cm. long, the pedicels 2 mm. long; bracts oblong, 5-nerved, 2 mm. long; calyx campanulate, 6 mm. long, glabrous, the short upper tooth emarginate, the 3 lower teeth broadly triangular, obtuse, about one-fourth as long as the tube; corolla 3 cm. long; keel loosely curled in less than one complete spiral.

Phaseolus scolecocarpus Piper, Contr. U. S. Nat. Herb. 22: 681. 1926.

Brushy rocky slopes or on sandbars, 400–850 meters; Zacapa; Chiquimula; Jutiapa; Santa Rosa. Yucatan Peninsula of Mexico.

A small herbaceous vine, probably perennial, the stems rather slender, densely pilose with fulvous spreading hairs; stipules subulate, 5-nerved, attenuate-acuminate, 6 mm. long, pilose; leaflets oblong-ovate or broadly rhombic-ovate, mostly 3-4 cm. long, obtuse or rounded at the apex and apiculate, rounded at the base, densely pubescent on both surfaces; peduncles densely pilose, longer than the leaves, the flowers crowded near the apex in a dense raceme of 8-10 flowers, these sessile; bracts subulate, 3-nerved, 4 mm. long, the bractlets equaling the calyx tube; calyx turbinate, ferruginous-pubescent, 5 mm. long, the upper lip with 2 broadly triangular, acute teeth, the 3 lower teeth narrowly triangular, more than half as long as the tube; corolla purple, 12-15 mm. long; keel tubular, the tip in 1 close spiral; legumes linear, pendent, stipitate, pubescent, long-rostrate, 10-12-seeded, somewhat contorted, scarcely more than 2 mm. wide, pubescent; seeds ellipsoid, brown speckled with black, 3 mm. long, 2 mm. wide, the very short hilum bordered with black.

Phaseolus speciosus HBK. Nov. Gen. & Sp. 6: 452. 1824.
Chorreeque; Choreane.

Dry to wet thickets, 200-1,900 meters; Alta Verapaz; Zacapa; Jutiapa; Santa Rosa; Chimaltenango; Sololá; Retalhuleu; reported also from Sacatepéquez and Quiché. Southern Mexico; Honduras; Costa Rica; Panama; South America.

A small or large, usually herbaceous vine, the stems rather densely pilose with spreading hairs; stipules small, oblong, striate; leaflets ovate or rhombic-ovate, 4-11 cm. long, acute or acuminate, rounded or broadly cuneate at the base, sparsely pilose above, usually densely pilose beneath with subappressed or spreading hairs; peduncles usually much longer than the leaves, the flowers few, clustered near the end of the peduncle, short-pedicellate, the bracts deciduous; calyx broadly campanulate, 6-7 mm. long, pubescent or glabrate, the upper lip short and broad, the 3 lower teeth large, broad, obtuse, shorter than the tube; corolla purple or pale purple, about 3 cm. long, the keel tubular, sigmoid; legume about 11 cm. long and 4-5 mm. wide, linear, strongly compressed, long-attenuate, strigose or glabrate, with few or numerous seeds.

Phaseolus spectabilis Standl. Contr. U. S. Nat. Herb. 17: 430.
pl. 25. 1914. *Chorreeque.*

Moist thickets, 2,000 meters or less; Alta Verapaz (type from Secanquím, *H. Pittier* 281); Zacapa; Escuintla; Huehuetenango. Honduras.

A slender, probably perennial, herbaceous vine, the stems densely pilose with short hairs; stipules oblong-ovate, 3-4 mm. long, obtuse or acute, striate-nerved; leaves slender-petiolate, the stipels oblong to rounded-ovate, 2 mm. long; leaflets ovate to oblong or rhombic-lanceolate, 5-11 cm. long, 2-6 cm. wide, acute or abruptly short-acuminate, rounded at the base, rather thick, scaberulous above or sparsely short-pilose, thinly or usually densely pilose beneath with short and mostly appressed hairs; racemes few-many-flowered, nodose, the bracts deciduous, ovate, acute or acuminate, 5-7 mm. long, the pedicels 4 mm. long or less; calyx pilose, the tube broadly campanulate, 5 mm. long, the upper lip very broad,

shallowly emarginate, the lower lip 3-lobate, the lobes twice as long as the tube or longer, lanceolate or ovate, 6 mm. wide or less, attenuate; flowers purple and white or cream, the standard 3 cm. long, sessile; keel coiled into several spirals; style barbate; legume linear, flat, about 14 cm. long and 8 mm. wide, straight, the valves glabrous, attenuate at the apex, the margins strongly thickened.

This has been reported from Guatemala as *P. speciosus* HBK. It and *P. stenolobus* are closely related and are somewhat anomalous in the genus *Phaseolus*. In general appearance as well as in form of calyx and legume they suggest *Centrosema* much more than *Phaseolus*, the fruit in particular being exactly that of *Centrosema*. They may deserve segregation as a separate genus, although the characters by which they are to be separated from the polymorphous group *Phaseolus* are not obvious. The flowers of this species are sometimes eaten in tamales or other dishes in Huehuetenango.

Phaseolus stenolobus Standl. Contr. U. S. Nat. Herb. 17: 431. 1914.

Moist thickets, 200–1,500 meters; Alta Verapaz; Zacapa; Santa Rosa (type from Cerro Redondo, *Heyde & Lux* 6135); Quezaltenango. Honduras.

A slender vine, herbaceous, probably perennial, the stems sparsely pilose with often reddish brown hairs; stipules lanceolate, acute, 3–4 mm. long, striate-nerved; leaflets thin, rhombic-ovate to deltoid-oblong, 6–11 cm. long, 3.5–7 cm. wide, acuminate, rounded or obtuse at the base, appressed-pilose or glabrate above, thinly pilose beneath; peduncles often much elongate, the racemes short and few-flowered; bracts lance-linear or lanceolate, 9–12 mm. long, deciduous, the pedicels 4 mm. long or less; calyx sparsely pilose, the tube broadly campanulate, 3–5 mm. long, the upper lip very short, shallowly emarginate, the 3 lower lobes linear, acute, 2–3 times as long as the tube, sometimes 1.5 cm. long; standard 3 cm. long, dull yellow marked with purple or purplish cream, or sometimes wholly dull pale yellow; keel coiled into several close spirals; style barbate above; legume linear, straight or slightly falcate, 7–14 cm. long, 6–7 mm. wide, glabrous, many-seeded, long-attenuate at the apex, glabrous, the valves with thickened margins.

Phaseolus Tuerckheimii Donn. Smith, Bot. Gaz. 56: 54. 1913.

Moist thickets or rather open forest, 1,200–2,400 meters; Alta Verapaz (type collected between Tactic and Cobán, *Tuerckheim* II.1536); El Progreso; Zacapa; Jalapa; Sacatepéquez; Quiché; Quezaltenango. Costa Rica; Panama.

A herbaceous vine, the stems sparsely pubescent or glabrous; stipules triangular-lanceolate, small, acute; leaflets oblong-ovate to broadly deltoid-ovate, 4–7 cm. long, acute or short-acuminate, rounded at the base, pubescent on the upper surface with spreading hairs, densely or in age thinly sericeous beneath; peduncles much exceeding the leaves, the racemes dense, elongate, many-flowered,

the rachis hirtellous, the flowers in fascicles of 2-5; bracts linear, 4-6 mm. long, somewhat persistent, the pedicels 4-9 mm. long; calyx campanulate, 3-4 mm. long, densely pubescent, the teeth shorter than the tube, the upper one emarginate, the 3 lower ones ovate, subacute; bractlets much shorter than the calyx; petals rose-purple, the standard 1.5 cm. long, the keel coiled in 2 spirals; legume falcate-oblong, densely fulvous-pilose, acute and long-rostrate, narrowed to the base (not seen in mature condition).

Phaseolus viridis Piper, Contr. U. S. Nat. Herb. 22: 693. 1926.

Moist or wet forest or thickets, 350-2,000 meters; Alta Verapaz (type from Cubilgüitz, *Tuerckheim* 8510); Santa Rosa; Suchitepéquez; Huehuetenango. Veracruz.

A very slender, herbaceous vine, glabrous almost throughout, the young leaflets ciliate; stipules triangular-oblong, 4-nerved, 2 mm. long; leaflets thin, rather narrowly deltoid-ovate to rounded-ovate, 5-10 cm. long, acuminate, apiculate; peduncles longer or shorter than the leaves, the racemes mostly 10-20-flowered, the bracts oblong-ovate, acute, 2 mm. long; pedicels slender, 5-10 mm. long, the bractlets oblong, half as long as the calyx; calyx campanulate, 2 mm. long, the upper tooth emarginate, the 3 lower teeth triangular, half as long as the tube; corolla purplish, the standard 8 mm. long; keel tubular, coiled into 2 spirals; legume falcate-oblong, strongly compressed, 2.5-4 cm. long, 8 mm. wide, acute and rostrate, glabrate; seeds little compressed, oval, 6 mm. long, marbled with ochraceous and brown, lustrous, the hilum rather large, surrounded by a brown border.

Phaseolus vulgaris L. Sp. Pl. 723. 1753. *Common bean* or *Kidney bean*. *Frijol*; *Chicong*, *Chicun* (Ixil); *Ubal*, *Cuyenc*, *Xenc* (Mame); *Pilln*, *Ch'ux*, *Quenc* (Poconchí); *Tut* (Chuje); *Chenec* (Tzentel); *Et* (Pipil of Salamá; *frijol negro*); *Quinac*, *Kim'ac*, *Ccap* (tender green pods), *Quencc* (Quiché); *Chicul* (Aguacatán); *Hubal* (Chuje of Saloma); *Tut* (Chuje of San Mateo); *Gupal*, *Hupal* (Jacaltenango); *Chenec* (Tzotzil); *Quina'c* (Pocomán); *Chicún* (Aguatecan).

Cultivated commonly in practically all parts of Guatemala except the highest regions; native of America, but the native region unknown; doubtless in cultivation for many centuries; now planted in almost all regions of the earth except in the colder areas.

Plants annual, erect or scandent; stipules small, striate; leaflets ovate or rhombic-ovate, thin, acuminate, glabrous or pubescent; peduncles shorter than the petioles, few-flowered, the flowers at or close to the apex; flowers small, white or bluish purple; legume linear, compressed or almost terete, slightly curved, varying in color from green to yellow, red, or almost black; seeds highly variable in shape, size, and color, little compressed, without conspicuous lines radiating from the hilum.

The Maya name is "bul" or "buhl." It is estimated that there are probably 200 recognizable types of the common bean and that in America and Europe from 400 to 500 commercial varieties have

been named. To one who has observed the great number of forms represented in the markets of Guatemala, this number will not seem excessive, for the local varieties are innumerable. The two most important vegetable foods of Guatemala are maize and beans, *frijol* or *frijoles*, and these are eaten two or three times each day by the vast majority of people who, in fact, scarcely consider that they have eaten unless these two staples constitute a part of the meal. For 1938-39 the production of *frijol* in Guatemala is estimated at more than 98,000,000 pounds, a truly vast amount for a population of some 3,000,000 persons. The leading departments in production are Chimaltenango, Jutiapa, Guatemala, Alta Verapaz, Chiquimula, Zacapa, Santa Rosa, and El Progreso. The bean crop is less affected by drought than is maize, and also it can be produced in a shorter time. When there is a very short supply of beans, substitutes can be found more easily than when there is scarcity of corn.

The variety of bean most used in Guatemala is the *frijol negro* or black bean, but of this there are numerous varieties. The most obvious forms are those with lustrous and matte surfaces, but housewives and cultivators recognize many others, and the former often spend much time in the market searching for the exact variety that they consider best, at least for some particular purpose. The other varieties run about the whole possible gamut of color, size, and shape combinations. Beans of this species, particularly the black, solid red, and white forms, are usually cultivated and sold in pure strains, but the spotted and some of the other colored varieties are often seen in the markets in motley mixtures. The common white navy bean of the United States, or varieties closely resembling it, is but little planted or eaten in Guatemala. It is called "*frijol blanco*." Most persons consider it very inferior to the *frijol negro*, but in the markets, strangely enough, it often brings a higher price.

Frijoles are served on the table in innumerable forms, but usually they are first boiled, then fried, or at least heated with the addition of fat, usually lard. When served on the table they are left entire with considerable liquid (*frijoles parados*) or mashed with considerable water (*frijoles molidos*) or mashed and fried until dry (*frijoles fritos*). In even the poorest *pensiones* and homes *frijoles* can almost always be depended upon to be well prepared, and they are more generally good than any other article of food. A kind of sandwich made with mashed *frijoles* enclosed in tortillas often is carried into the fields for noon lunch, or as provision for travelers. Travelers often carry a particular form called *shepes*, because they remain

edible for a long time without spoiling. They are made of maize paste and beans boiled dry and heavily salted, and mixed with minced flowers of *chipilín* (*Crotalaria*). This paste is wrapped in corn husks and boiled two hours in water.

String beans are a common vegetable, but the mature fresh seeds are little used. Soup or *caldo de frijol* is a very common luncheon dish in Guatemala, as in other parts of Central America. In the Cuchumatanes there is cultivated a bean called "irich" (possibly a form of *P. coccineus* rather than *P. vulgaris*) with yellow pods, which is eaten with the pods even when the latter are almost dry. The pods are said to be always tender and palatable. In the same mountains (in Huehuetenango) Dr. Webster McBryde found a wild bean called "maat" whose small pods and seeds are cooked and eaten whole. Its identity is unknown to us. In the Cuchumatanes there is cultivated a large kidney bean called "chamborote." A variety with nearly black pods containing almost ripe seeds is sold in the market of San Juan Chamelco (Alta Verapaz), and perhaps in this also the pods are cooked with the seeds.

The names for the varieties are very numerous, but we have not collected them carefully. For the Jocotán (Chiquimula) region Wisdom reports the following varieties: "frijol taleté" and "frijol pacho," black varieties; "frijol pocajul," with black, violet and spotted seeds; "frijol perome," small, and dull black or ashy; "frijol chaján" or "frijol enredador," grown in the highlands, with black, red, white, or spotted seeds; "frijol terezo," a black bush bean; "frijol arbolito," "frijol siete caldos," or "frijol chapín," a small black bean; "frijol vellano," another small black bean. From the Jacaltenango (Huehuetenango) region LaFarge and Byers report various varieties: "nimex yat," with striped, black, or spotted seeds; "paxhai," a small bean that comes in all colors; "teinapul," a black bean; "omon," black; "k'os," a black bush bean; "saxupal," white; "kaq tela," a red bean with red pods. "Frijol de bolonilla" is a small black bean from the market of Retalhuleu, said to come from Quiché. "Frijol aluvia," bought in the market of Totonicapán, is an unusual form with rather large, very thick, white seeds. "Frijol mamaquén" of Cobán has white flowers and rather dark, dull, brownish red seeds of medium size.

The methods of cultivation of beans in Guatemala are not varied like those for maize. The plants, as is well known, will produce well upon poor soils, better than most other agricultural crops. In the limestone regions of Alta Verapaz and Petén, where drainage soon

dries the soil, beans, like maize and other crops, usually are planted in small depressions between the rocks, because only in such places is soil available and moisture conserved.

Phaseolus xanthotrichus Piper, Contr. U. S. Nat. Herb. 22: 698. 1926.

Known in Guatemala only from the type, Laguna de Ayarza, Santa Rosa, Heyde & Lux 4171. Costa Rica.

A herbaceous vine, the stems slender, pilose with spreading fulvous hairs; stipules ovate, subacute, 7-nerved, 3 mm. long; leaflets thin, ovate, 2-3 cm. long, acuminate, broadly rounded at the base, 8-nerved, strigose-pilose on both surfaces; peduncles slender, pilose, 2-3 cm. long, the racemes lax and few-flowered, the bracts elliptic, acute, 2 mm. long; pedicels slender, twice as long as the calyx, the bractlets minute, ovate, soon deciduous; calyx campanulate, 3 mm. long, pilose, the upper tooth very short, emarginate, the lateral teeth rounded, the middle one acute, the lower teeth half as long as the tube; corolla 13 mm. long; keel with two and one-half close spirals; legume linear, falcate, compressed, glabrous, 8-10-seeded, 4 cm. long, short-rostrate.

PISCIDIA L.

Reference: S. F. Blake, Revision of *Ichthyomethia*, a genus of plants used for poisoning fish, Journ. Wash. Acad. Sci. 9: 241-252. 1919.

Trees or shrubs; leaves alternate, odd-pinnate, the leaflets opposite, not stipellate; flowers rather large, white or pink or reddish, in small lateral panicles; bracts caducous, the bractlets minute or none; calyx teeth short, broad, the 2 upper ones subconnate; standard orbicular, not appendaged, the wings falcate-oblong, the keel obtuse; vexillar stamen free at the base, connate above with the others, the anthers versatile; ovary sessile, many-ovulate, the style filiform, incurved, the stigma small, terminal; legume linear, compressed, indehiscent, many-seeded, longitudinally 4-winged, the wings broad; seeds oval, compressed, the radicle inflexed.

Probably four species, ranging from Florida and Mexico to northern South America. Only the following are known in Central America. The genus can be recognized by its fruit, quite unlike that of any other Central American plant, hard and indehiscent, with 4 broad longitudinal wings.

Leaflets densely tomentose beneath with loose spreading hairs. . . . *P. grandifolia*.
Leaflets minutely sericeous beneath with closely appressed hairs. . . . *P. piscipula*.

Piscidia grandifolia (Donn. Smith) I. M. Johnston, Contr. Gray Herb. 70: 71. 1924. *Ichthyomethia grandifolia* Blake, Journ. Wash. Acad. Sci. 9: 245. 1919. *Derris grandifolia* Donn. Smith, Bot.

Gaz. 56: 55. 1913. *Palo de zope*; *Zopilote*; *Pacaché*, *Zopilocobo*, *Zopilocuajo* (fide Tejada); *Llora-sangre* (Huehuetenango).

Forested, usually rather dry hillsides or *barrancos*, 400–1,900 meters; Baja Verapaz; Chiquimula; Jalapa; Santa Rosa (type from Cerro Gordo, *Heyde & Lux* 3709); Guatemala; Sacatepéquez; Huehuetenango. Southwestern Mexico; Honduras.

A tree of 15 meters or less with rather broad crown and pale bark, the branchlets cinereous-tomentulose; leaflets 7–11, petiolulate, rather thick, oval to ovate or elliptic-oblong, 6–12 cm. long, rounded to subacute at the apex, rounded at the base, dull green and glabrate above, the veins impressed, whitish or grayish beneath and densely soft-tomentose; panicles cylindric, 10–15 cm. long, the pedicels 1.5–4.5 mm. long; calyx 7–8 mm. long, densely pilosulous; petals pink and white, the standard 1 cm. long; legume 4–11 cm. long, 2.5–5 cm. wide, 3–5-seeded, densely sordid-pilosulous, the wings as wide as the body or wider, somewhat ruffled, the stipe much longer than the calyx.

Well known in Guatemala by the name “palo de zope” or “palo de zopilote.” In Salvador the wood is used for fuel and for railroad ties, the latter use indicating that it is considered durable. About Antigua this tree is frequent in the coffee plantations. In the past it has been planted as coffee shade, but it is said to be unsatisfactory for the purpose. It is stated that in Baja Verapaz the bark is employed as a *barbasco* (fish poison). A sterile specimen from Chiquimula is noteworthy for its glabrate leaves and is referable to *P. grandifolia* var. *glabrescens* Sandwith, described originally from the state of Mexico, Mexico, where it is called “cahuirrica prieta.”

Piscidia piscipula (L.) Sarg. Gard. & For. 4: 436. 1891. *Erythrina piscipula* L. Sp. Pl. 707. 1753. *P. Erythrina* L. Syst. Pl. ed. 10. 1155. 1759. *Ichthyomethia piscipula* Hitchc. ex Sarg. Gard. & For. 4: 472. 1891. *P. americana* Moc. & Sessé, Pl. Nov. Hisp. 116. 1887. *I. communis* Blake, Journ. Wash. Acad. Sci. 9: 247. 1919. *I. americana* Blake, op. cit. 248. *Habin* (Petén, Maya).

In lowland forest or thickets, 300 meters or less; Petén; Escuintla. Southern Mexico; British Honduras; Ruatán Island, Honduras; southern Florida; West Indies; northern South America.

A large shrub or a tree, sometimes 15 meters high, the branchlets strigillose at first; leaflets 9–13, petiolulate, elliptic-oblong to obovate-oval, 4–8 cm. long, obtuse or rounded at the apex, rarely acute, rounded at the base, glabrous above or nearly so, minutely and usually densely strigillose beneath, pale; panicles 8–20 cm. long, the pedicels 2–7 mm. long; calyx 6–7 mm. long, strigillose with pale hairs; petals pink or white and red, the standard 1.5 cm. long; legume 2–7.5 cm. long, 2–4 cm. wide, 1–6-seeded, strigillose, the wings glabrate, much wider than the body, thin, undulate or ruffled, the stipe much longer than the calyx.

Called "dogwood" and "May bush" in British Honduras. The wood is yellowish brown, lustrous, the sapwood gray; hard and heavy, the specific gravity 0.87, the weight about 54 pounds per cubic foot; grain fairly roey, the texture medium; rather difficult to work, takes a high polish, is very strong and durable. It has been used in various regions for boat and vehicle construction, firewood, and charcoal, also for posts and piling. The dry bark, especially that of the root, is reported to have a strong and disagreeable odor resembling that of opium, and it produces a burning sensation in the mouth. It contains various narcotic substances, one of which has been named piscidin. An extract of the bark, applied locally, has been used in tropical America to relieve toothache, and in Jamaica to cure mange in dogs. The most remarkable use of the tree, however, is as a fish poison, the bark and leaves being crushed and thrown into the water, where they soon stupefy the fish, causing them to float upon the surface. *Piscidia* bark is said to be used in this manner in Baja Verapaz and probably in other parts of Guatemala. The specific name assigned by Linnaeus refers to the poisonous properties of the genus.

PISUM L. Pea

Glabrous annuals, diffuse or scandent by tendrils; leaves pinnate, the leaflets 1-3 pairs, the rachis terminating in a bristle or tendril; stipules foliaceous, semi-cordate or semisagittate; flowers large, purple, pink, or white, on elongate axillary peduncles, solitary or few and racemose, the bracts caducous, minute; bractlets none; calyx oblique at the base or dorsally gibbous, the lobes subequal or the 2 upper ones broader; standard obovate or suborbicular, unguiculate, the wings falcate-oblong; keel shorter than the wings, incurved, obtuse; vexillar stamen free or connate at the middle with the others, the filaments slightly dilated above, the anthers uniform; ovary subsessile, many-ovulate, the style inflexed, dilated, barbate on the inner surface, the stigma subterminal; legume more or less compressed, obliquely acute, 2-valvate; seeds subglobose, the funicle dilated into a slender aril; cotyledons thick, the radicle inflexed.

About 6 species, natives of the Mediterranean region and western Asia.

***Pisum sativum* L. Sp. Pl. 727. 1753. *Alberjas*; *Chekén* (Cobán, Quecchí). *Pea*.**

Native of Europe and western Asia, cultivated in most parts of the earth for food; planted commonly in Guatemala at middle and rather high elevations.

Plants annual, glabrous and glaucous, scandent by tendrils; stipules foliaceous, deeply cordate at the base, usually dentate, often larger than the leaflets; leaflets

2-3 pairs, oval or ovate; flowers few, at the apex of a long peduncle, white, 1.5-2 cm. long; seeds globose, whitish or clay-colored.

Known in Salvador as "petits pois." In Costa Rica a Spanish form of the same French term is used, "petipoá." Peas are one of the common vegetables of many Guatemalan markets, and they are highly esteemed, as in other regions where they are grown. They are grown extensively for market in Guatemala, also in Sacatepéquez, especially about San Lucas and on the slopes of Volcán de Agua above Santa María de Jesús. The fields on Agua, at the upper limit of cultivation there, may be recognized at a long distance by their peculiar shade of green. Many of the peas are grown with irrigation, as at Almolonga and Zunil, but they thrive during the dry season without watering on the sandy slopes of Volcán de Zunil, where there are heavy fogs every afternoon and night. The peas of Cobán are very good, better than those we have tasted elsewhere in Guatemala, perhaps because they are better harvested and cooked. It is a practice in most other parts of the country to gather peas only when pods and seeds are turning yellow, and the seeds therefore hard and without their fresh flavor. Like most other vegetables, peas grow particularly well at Tactic, where the plants are often 1.5 meters high or taller and loaded with flowers and large plump pods.

PLATYMISCIUM Vogel

Trees or shrubs; leaves opposite or verticillate, odd-pinnate, the leaflets opposite, not stipellate; stipules caducous; flowers yellow, racemose, the racemes fasciculate in the leaf axils or at defoliate nodes, the bracts and bractlets small; calyx usually acute at the base and more or less turbinate, the teeth short, subequal; standard orbicular or ovate, not appendaged, the wings oblique-oblong; keel straight or slightly incurved, obtuse, the petals connate dorsally near the apex; stamens monadelphous, or the vexillar one rarely free, the anthers versatile; ovary long-stipitate, 1-ovulate, the style filiform, incurved, the stigma small, terminal; legume stipitate, oblong, flat, membranaceous, indehiscent, the margins thin or slightly thickened; seed large, reniform, compressed, the radicle inflexed.

About 15 species, in tropical America. One or two others occur in southern Central America.

Platymiscium dimorphandrum Donn. Smith, Enum. Pl. Guat. 6: 69. 1903, nomen; Bot. Gaz. 37: 208. 1904. *Palo de hormiga*; *Hormigo*; *Cachimbo*; *Palo de marimba*; *Marimbano* (fide Aguilar); *Sanquitché* (Quecché).

Wet or rather dry, mixed forest, 1,400 meters or lower; Petén; Alta Verapaz (type from Cubilgüitz. *Tuerckheim* 8199); Baja Vera-

paz; Izabal; Chiquimula; Jutiapa; Escuintla; Suchitepéquez; Retalhuleu; Quezaltenango; Huehuetenango. British Honduras; Honduras; Salvador(?).

A large tree, sometimes 30 meters high, the trunk 50 cm. or more in diameter, glabrous throughout or nearly so; stipules ovate or oblong, 10–14 mm long; leaves long-petiolate, the leaflets 5 or sometimes 3, long-petiolulate, subcoriaceous at maturity, lustrous, and rather prominently reticulate-veined, oblong-elliptic to ovate or oval, 5–15 cm. long, 3–8 cm. wide, abruptly short-acuminate or long-acuminate, with an obtuse tip, acute to almost rounded at the base; racemes glabrous, 10–25 cm. long, many-flowered, fasciculate, subsessile, the pedicels 1–1.5 mm. long, the bracts and bractlets small and narrow; calyx acute at the base, the tube 2.5–3.5 mm. long, the 3 lower teeth acute or acuminate, the 2 upper ones connate to form one bidentate one; standard orbicular, 1 cm. long, cuneate at the base; alternate stamens sterile; ovary short-stipitate; legume oblong, about 7 cm. long and 2 cm. wide, very thin, glabrous, reticulate-veined, obtuse, attenuate to the acute base.

What is probably this species is sometimes known in Salvador as “granadillo.” A satisfactory treatment of this genus as it is represented in northern Central America is impossible at present for lack of adequate material. It may be that more than a single species occurs in Guatemala, one of them being *P. yucatanum* Standl., but that may not be distinct from *P. dimorphandrum*. The tree has been reported from British Honduras as *P. yucatanum*. The name “hormigo” alludes to the fact that the tree often is infested with ants that bite painfully. *P. dimorphandrum* is an important lumber tree of Guatemala. It is closely related to *P. polystachyum*, whose wood is rich red or reddish brown, uniform or with lighter or darker veining, lustrous, the sapwood thick, yellowish white; hard and heavy, the specific gravity about 1.00, the grain roey; texture rather fine; not very difficult to work, finishes smoothly, takes a high polish, holds its place well, is highly durable. The wood of *P. polystachyum*, and probably also that of *P. dimorphandrum*, is employed locally for furniture and cabinetwork, and it has been exported to the United States for billiard cue butts and as a substitute for cocobolo in making tool handles. In Guatemala it is believed to be the favorite wood for making the keys of marimbas.

POIRETIA Ventenat

Plants herbaceous or suffrutescent, twining, glandular-punctate; leaves pinnate, the leaflets small, 4 or rarely 3, entire, usually minutely stipellate; stipules sessile or short-decurrent on the stems; flowers small, yellow, in axillary racemes or terminal panicles, the bracts lanceolate or subulate, the bractlets small; calyx shallowly dentate; standard broadly orbicular, reflexed, the wings falcate-oblong; keel strongly incurved, subrostrate, or rarely oblong and obtuse; stamens mona-

delphous, the anthers subreniform, the alternate ones sometimes slightly larger; ovary sessile, many-ovulate, the style incurved, the stigma terminal; legume linear, articulate, compressed, the joints oblong or quadrate, membranaceous or subcoriaceous, reticulate or verrucose.

About 5 species, in tropical America. Only the following is known from Central America.

Poiretia scandens Vent. Choix Pl. pl. 42. 1803. *Tabaquillo* (Jutiapa); *Bejuco hediondillo* (Escuintla); *Chipilín de culebra* (Jutiapa).

Wet to dry, often rocky thickets, 1,800 meters or less; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Huehuetenango. Southern Mexico; Costa Rica; southward to Brazil and Peru.

Plants glabrous or nearly so except in the inflorescence, the stems herbaceous or suffrutescent; stipules small, lanceolate or subulate, deciduous; leaves long-petiolate; leaflets 4, broadly obovate or orbicular, thin, 1-2 cm. long, broadly rounded at the apex, rounded or obtuse at the base, conspicuously gland-dotted, paler beneath; racemes axillary, with few or numerous flowers, mostly shorter than the leaves, the pedicels 2-4 mm. long; calyx 2 mm. long, pale green, glabrous or nearly so, gland-dotted; petals yellow, 6 mm. long, the standard rather long-unguiculate, densely gland-dotted; legume 1.5-2.5 cm. long, glabrous, smooth, the joints few, 6-8 mm. long, 3-4 mm. wide, truncate at each end, rather rigid and hard, sometimes verruculose at the center.

Some of the vernacular names are given because the fresh plant has a disagreeable odor, somewhat suggestive of that of tobacco.

PTEROCARPUS L.

Reference: Paul C. Standley, The Mexican and Central American species of *Pterocarpus*, Trop. Woods 28: 10-14. 1931.

Unarmed trees; leaves alternate, odd-pinnate, the leaflets mostly alternate, not stipellate; flowers yellow, sometimes whitish or tinged with violet, usually rather large and showy, racemose or paniculate, axillary and terminal, the bracts and bractlets small, caducous; calyx turbinate, often incurved, the upper 2 teeth or lobes more or less connate; petals glabrous, the standard orbicular or broadly ovate, the wings obliquely obovate or oblong; keel petals similar to the wings or shorter, free or short-connate dorsally; stamens monadelphous, or the vexillar one free, the anthers versatile; ovary sessile or stipitate, few-ovulate, the style filiform, slightly incurved, the stigma small, terminal; legume compressed, indehiscent, orbicular to ovate or oval-oblong, somewhat oblique, the style usually lateral, somewhat indurate over the seeds, the margins winged or carinate; seeds 1-2, separated by septa, oblong or subreniform; radicle short, incurved.

About 30 species, in the tropics of both hemispheres. Only the following species occur in Central America.

Calyx glabrous; legume with very narrow, thick wings, or the wings often obsolete, the central portion of the fruit surrounding the large seed broad and corky-thickened. *P. officinalis*.

Calyx densely pubescent; legume with broad thin wings, these wider than the small seed-bearing portion. *P. Hayesii*.

Pterocarpus Hayesii Hemsl. Diagn. Pl. Mex. 8. 1878; Biol. Centr. Amer. Bot. 5: pl. 17. *P. reticulatus* Standl. Trop. Woods 16: 38. 1928 (type from Boca, British Honduras, C. S. Brown 15). *Chejá*.

Wet mixed lowland forest, 900 meters or lower; Alta Verapaz; Izabal; Suchitepéquez; doubtless also in Petén. British Honduras; Panama.

A tall tree, often 30 meters high or more, the trunk 30 cm. in diameter or larger, the bark light gray, smooth, the branchlets brownish-tomentulose; leaves petiolate, the leaflets mostly 7-10, alternate or subopposite, on petiolules 4-5 mm. long, oblong or elliptic-oblong, 7-10 cm. long, abruptly acute or acuminate, with a rounded or subemarginate tip, rounded at the base, bright green above, slightly paler beneath and tomentulose or puberulent, or in age glabrate, the venation slightly elevated and closely reticulate on both surfaces; racemes solitary or in small panicles, many-flowered, the rachis tomentulose; pedicels very slender, 6-7 mm. long; calyx brownish-tomentulose, 7-8 mm. long, acute at the base, the lobes obtuse or rounded; petals bright yellow, the standard 14 mm. long; ovary densely appressed-pilose; fruit suborbicular, 5-6 cm. long, brownish-tomentulose, the wing very thin and broad, usually much broader than the hard reticulate-veined seed-bearing portion.

Pterocarpus officinalis Jacq. Stirp. Amer. 283. pl. 183, f. 92. 1763. *P. draco* L. Sp. Pl. ed. 2. 1662. 1763, in part. *P. belizensis* Standl. Trop. Woods 7: 6. 1926. *Sangre de drago*; *Sangregado*.

Wet mixed forest, at or near sea level, most common in periodically inundated forest near the seashore; sometimes in mangrove swamps; Izabal. Yucatan; British Honduras to Panama; West Indies; northern Central America.

A medium-sized or usually tall tree with a slender trunk and thin buttresses, the bark smooth, the sap blood-red, glabrous throughout or nearly so; leaflets 7-9, oblong to ovate, 10-18 cm. long, gradually or abruptly acuminate, with obtuse tip, conspicuously and closely reticulate-veined; calyx glabrous, 5 mm. long, the lobes short and broad, obtuse or rounded; petals yellow, 1 cm. long or slightly longer; flowers paniculate; fruit 5-10 cm. broad, suborbicular, glabrous or nearly so, compressed, the seed-bearing portion compressed, very broad, hard, the wings narrow or sometimes obsolete, thick.

Known in British Honduras as "kaway" or "swamp kaway"; "sangre," "cowee" (Honduras). Old World species of *Pterocarpus* furnish some of the most valuable cabinet woods of the world, but the wood of American species is of only minor importance. It is

white or whitish, dull to lustrous, sometimes with greenish or dark red areas caused by injury; very soft and light to moderately hard, the grain fairly straight; texture rather fine; cuts easily, finishes smoothly, is not durable. It is used in Central America for miscellaneous purposes, where not exposed to weather or attacks of termites. The blood-red sap exuding from the cut bark soon solidifies into a red resin that is insipid and inodorous. Formerly it was used in medicine under the name "dragon's-blood," and large amounts of it were sent to Spain from Cartagena, Colombia. *P. officinalis* is abundant along the coast of Izabal, especially in swamps inundated at high tide. The characteristic fruits are produced in huge quantities and often cover the water of the swamps. They are among the most plentiful of the seeds cast up on the seashore.

RHYNCHOSIA Loureiro

Herbs or shrubs, twining, prostrate, or rarely erect; leaves pinnately 3-foliolate, the stipels minute or none, the leaflets broad, entire, resinous-punctate beneath; stipules ovate or lanceolate; flowers small or rather large, yellow, the standard sometimes striped or tinged with purple or dark red, in axillary racemes, the pedicels solitary along the rachis or geminate, the bracts caducous; bractlets none; calyx lobes unchanged after anthesis, the 2 upper ones more or less connate; standard obovate or orbicular, spreading or reflexed, with inflexed auricles at the base; ovary sessile, 2-ovulate or rarely 1-ovulate, the style incurved above, filiform or thickened, the stigma small, terminal; legume compressed, obliquely orbicular, oblong, or falcate, 2-valvate, continuous within or rarely septate; seeds usually 2, compressed-globose or subreniform, often red, the hilum lateral, short or oblong, the strophiole small and thick or none.

About 150 species, in the tropics of both hemispheres, a few extending into temperate North America. A few additional species have been described from southern Central America.

Calyx lobes, at least the lower ones, equaling or longer than the corolla, free almost to the base; seeds brown or grayish.

Pubescence of the lower leaf surface mostly or wholly of appressed hairs, at least the hairs of the nerves appressed; stems usually angulate; legume 7-8 mm. wide. *R. hondurensis*.

Pubescence of the lower leaf surface usually wholly of spreading hairs, the leaflets densely velutinous-pilous beneath; stems subterete; legume usually 10 mm. wide. *R. longeracemosa*.

Calyx lobes much shorter than the corolla, the calyx with a conspicuous tube, this sometimes longer than the lobes.

Flowers large, mostly 18-20 mm. long or even larger. *R. discolor*.

Flowers small, usually 10 mm. long or less, rarely as much as 15 mm.

Stems viscid-pilose. *R. ixodes*.

Stems without viscid pubescence.

Legume 4-5 mm. wide, not constricted between the seeds; flowers about 6 mm. long; seeds very dark brown or blackish.....*R. minima*.

Legume 8-12 mm. wide, sometimes constricted between the seeds; flowers 8-12 mm. long or even larger; seeds at least in part red.

Legume not constricted between the seeds; seeds scarlet...*R. jalapensis*.

Legume constricted between the seeds; seeds scarlet and black.

R. pyramidalis.

Rhynchosia discolor Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 199. 1843. *Chorrequé amarillo*; *Frijol de casampulga*; *Tripas de gallina*.

Dry or moist, often rocky, brushy hillsides, often in oak or other forest, 900-2,500 meters; Zacapa; Jalapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Sololá; Huehuetenango; Quezaltenango; San Marcos. Southern Mexico.

Usually a large vine, often woody below, the stems subterete, sordid-tomentulose or short-villous; leaves long-petiolate, the leaflets rhombic-ovate or rounded-ovate, mostly 6-10 cm. long, acute or acuminate, rather thick, velutinous-pubescent above or finally glabrate, densely pilose beneath or subtomentose, the pubescence often whitish; racemes usually longer than the leaves, many-flowered, lax, viscid-hirsute and densely short-pilose, the flowers short-pedicellate; flowers mostly 2-2.5 cm. long, the standard greenish brown, densely short-pilose outside, the wings yellow; calyx viscid-pilose, about 12 mm. long, the lowest lobe longer and narrower than the others; legume narrowly oblong-oblancheolate, 4-5 cm. long, 8-12 mm. wide, not constricted between the seeds, long-rostrate, attenuate to the base, very densely viscid-pilose with long spreading hairs.

This is presumably the species reported from Guatemala as *R. macrocarpa* Benth. We have seen no authentic material of either *R. macrocarpa* or *R. discolor*, and there is some doubt that they are distinct. The pulverized seeds are reported as one of the "remedies" for snake bites in Zacapa.

Rhynchosia hondurensis (Rose) Donn. Smith, Enum. Pl. Guat. 8: 172. 1907. *Dolicholus hondurensis* Rose, Contr. U. S. Nat. Herb. 10: 101. 1906. *Ixbeho* (Petén, Maya).

Moist or dry thickets or forest, 350 meters or less; Petén; Santa Rosa; Escuintla; Retalhuleu. British Honduras; Honduras, the type from San Pedro Sula.

A small vine, herbaceous or suffrutescent at the base, the stems usually acutely angulate, densely pilose with soft spreading whitish hairs; stipules small, lance-triangular; leaflets ovate to ovate-orbicular, 2-7.5 cm. long, acute or subacuminate to very obtuse at the apex, sparsely or densely pilose above with mostly appressed hairs, more densely pilose beneath and densely dotted with yellow glands; racemes equaling or longer than the leaves, with few or often very numerous flowers, at first dense but becoming interrupted, the pedicels 1 mm. long; calyx 6-7 mm. long, cleft almost to the base, the lobes linear-lanceolate, attenuate, appressed-pilose,

brown and persistent in fruit, conspicuously nerved; petals scarcely exceeding the calyx, yellow or at least in age brownish red, the standard sparsely pubescent; legume 10–18 mm. long, 5–6 mm. wide, scarcely or not at all constricted between the seeds, finely pubescent, short-rostrate; seeds small, somewhat compressed, mottled with light and dark brown.

This has been reported from Petén and British Honduras as *R. longeracemosa* Mart. & Gal.

Rhynchosia ixodes Standl. Field Mus. Bot. 4: 214. 1929.
Dolicholus ixodes Standl. Contr. U. S. Nat. Herb. 18: 107. 1916.
Mielillo; *Frijolillo*.

Moist or dry, open or brushy, often rocky hillsides, 400–1,500 meters; Chiquimula; Jalapa; Guatemala. Campeche; Honduras; Costa Rica; Panama.

A small herbaceous vine, sometimes apparently procumbent, the slender stems viscid-pilose with spreading hairs; stipules lanceolate, 4–5 mm. long; leaflets broadly deltoid-ovate, mostly 1–3.5 cm. long and 1–3 cm. wide, acute or subacuminate, broadly rounded or truncate at the base, rather densely viscid-pilosulous on both surfaces; racemes equaling or longer than the leaves, few-flowered, the flowers crowded near the apex, the bracts short and inconspicuous, the pedicels 2–4 mm. long; calyx 5 mm. long, densely viscid-pilose, the lobes twice as long as the tube, subequal, the lowest one slightly longer, linear or linear-attenuate; corolla 8–9 mm. long, reddish brown, the standard broadly oblong, viscid-pilosulous outside, the keel and wings of about the same length; legume 1.5–2.5 cm. long, acute and rostrate, not constricted between the seeds, viscid-hirsute; seeds compressed, dark reddish brown, 3.5 mm. long.

Rhynchosia jalapensis Standl. & Steyerl. Field Mus. Bot. 23: 57. 1944.

In thickets, about 1,400 meters; Alta Verapaz; Jalapa (type collected between Jalapa and San Pedro Pinula, *Steyermark* 32945). Honduras.

Plants twining, herbaceous or perhaps suffrutescent below, the stems subangulate, densely velutinous-pilosulous; stipules lance-oblong, brown, deciduous; leaflets broadly oblique-ovate to rhombic or almost orbicular, 4–9.5 cm. long, 2.5–6.5 cm. wide, acute or abruptly short-acuminate, rounded at the base, finely velutinous-pilosulous, more densely so beneath, with numerous small amber-colored glands beneath; racemes equaling or longer than the leaves, many-flowered, lax, the bracts lanceolate, caducous, the pedicels 3 mm. long or shorter; calyx 5 mm. long, densely pilosulous, the lobes lance-attenuate, about equaling the tube, or the lowest one slightly longer; corolla 9–10 mm. long, the standard narrow, densely pubescent outside; legume narrowly oblong, about 3 cm. long and 1 cm. wide, acute and long-rostrate, acute at the base, not or very obscurely constricted between the seeds, densely velutinous-pubescent; seeds oval, scarcely compressed, 6–7 mm. long, bright scarlet.

Rhynchosia longeracemosa Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 198. 1843.

Moist or wet thickets or forest, sometimes in oak forest, often on limestone, 1,000–2,000 meters; Alta Verapaz; Baja Verapaz; Chiquimula; Jalapa; Quezaltenango; Huehuetenango. Southern Mexico; Honduras; Costa Rica.

A small or rather large vine, usually herbaceous, the stems somewhat angulate, densely pilose with spreading or reflexed hairs; leaflets deltoid-ovate or rhombic-ovate, 4–7 cm. long, acute or acuminate, broadly rounded at the base, often rugose, densely and softly pubescent on both surfaces, more densely so and paler beneath, the glands very inconspicuous or none; racemes mostly much longer than the leaves and on elongate peduncles, dense and many-flowered, the flowers short-pedicellate; calyx about 1 cm. long, cleft almost to the base, the segments lance-linear, densely appressed-pilose; corolla about equaling the calyx, the standard brownish red, the wings yellow, the keel whitish; legume oblong, scarcely or not at all constricted between the seeds, about 2 cm. long and 1 cm. wide, rostrate, narrowed at the base, ferruginous or dark brown, sparsely pilosulous or glabrate; seeds small, compressed, dark brown.

Rhynchosia minima (L.) DC. Prodr. 2: 385. 1825. *Dolichos minimus* L. Sp. Pl. 726. 1753. *Dolicholus minimus* Medic. Vorl. Chur. Phys. Ges. 2: 354. 1787.

Moist or dry thickets, often in second growth, sometimes in marshes or on gravel beds along streams, 1,300 meters or less; Petén; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Suchitepéquez; Retalhuleu; Quiché; Huehuetenango. Southern United States; Mexico; British Honduras to Salvador and Panama; West Indies; South America.

A small slender vine, probably annual, twining or prostrate, the stems angulate, densely puberulent; stipules subulate, 2 mm. long; leaflets rhombic-ovate or rhombic-orbicular, 1–3 cm. long, obtuse or acute, obtuse or rounded at the base, minutely pubescent, densely dotted beneath with chiefly black glands; racemes very slender, equaling or longer than the leaves, with few or numerous flowers, these mostly remote, reflexed in age, the pedicels very short; calyx 2–3 mm. long, the lobes lanceolate, longer than the tube, puberulent; corolla yellow, 5–6 mm. long, the standard puberulent and gland-dotted; legume 10–17 mm. long, 4 mm. wide, puberulent, black-dotted; seeds small, compressed, mottled with light and dark brown.

The Maya names of Yucatan are recorded as “ibcho” and “mehenibbech”; “choncho” (Salvador).

Rhynchosia pyramidalis (Lam.) Urban, Repert. Sp. Nov. 15: 318. 1918. *Dolichos pyramidalis* Lam. Encycl. 2: 296. 1786. *Glycine phaseoloides* Swartz, Prodr. Veg. Ind. Occ. 105. 1788. *R. phaseoloides*

DC. Prodr. 2: 385. 1825. *Dolicholus phaseoloides* Kuntze, Rev. Gen. 3, pt. 2: 62. 1898. *Tusup* (Suchitepéquez); *Pitillo*.

Wet to dry thickets, often in second growth, frequent as a weed in hedges, sometimes in forest, 1,500 meters or less; Petén; Alta Verapaz; Izabal; Chiquimula; Jutiapa; Escuintla; Guatemala; Suchitepéquez; Quezaltenango; San Marcos. Mexico; British Honduras to Salvador and Panama; West Indies; South America.

A small or large vine, herbaceous or sometimes woody below, the larger stems compressed, the young branches densely pilosulous; leaflets ovate to rhombic or deltoid-ovate, 3-12 cm. long, acute or acuminate, pubescent or glabrate above, puberulent or pilosulous beneath, sometimes densely so, often densely dotted with dark or red glands; racemes 5-15 cm. long, few-many-flowered, short-pedunculate, lax or dense, the pedicels 1-2 mm. long; calyx densely pilosulous, 3-4 mm. long, the narrow lobes equaling or slightly exceeding the tube; corolla reddish yellow, 8-10 mm. long, the standard densely pubescent outside; legume compressed, 1.5-2.5 cm. long, about 1 cm. wide, constricted between the seeds, densely pubescent, short-rostrate; seeds scarlet with a black side or end, or almost wholly black.

Known in Salvador as "ojo de cangrejo," "huevos de casampulga," or "frijol casampulga"; "ojitos de picho" (Tabasco). In Salvador the stems and leaves are often used by washerwomen to scrub dirt from clothing. The handsome seeds are used commonly for making bracelets and necklaces. It is believed popularly in Central America that the seeds are poisonous.

SESBANIA Scopoli

Plants annual or perennial, herbaceous or sometimes fruticose; leaves even-pinnate, the rachis with a setaceous tip, the leaflets numerous, mostly oblong, obtuse or rounded and mucronate at the apex; stipules small, deciduous; flowers medium-sized or large, in axillary racemes, the bracts and bractlets small, caducous; calyx broadly campanulate, turbinate at the base, as broad as long, the teeth short, deltoid, acute or acuminate; corolla yellow or white, the standard longer than the other petals, suborbicular, reflexed, often appendaged at the base, short-unguiculate; keel petals lunate, obtuse or rounded at the apex; stamens diadelphous; legume linear, slender, terete or somewhat compressed, short-stipitate, rostrate, many-seeded, with cross partitions between the seeds, 2-valvate; seeds cylindric-oblong, slightly compressed, subtruncate at each end, brown, smooth.

About 50 species, in tropical and warmer regions of both hemispheres. One other species has been reported from Central America. *S. grandiflora* (L.) Poir., native of the Old World tropics, with white or red flowers 6-8 cm. long, is cultivated occasionally in Central America, but we have not observed it in Guatemala. By some authors the generic name is written *Sesban*.

Stems and lower surface of the leaflets rather densely sericeous-villous. *S. sericea*.
Stems and lower surface of the leaflets glabrous or essentially so. *S. Emerus*.

Sesbania Emerus (Aubl.) Urban, Repert. Sp. Nov. 16: 149. 1919. *Aeschynomene Emerus* Aubl. Pl. Guian. 775. Tabl. Noms 1. 1775. *S. occidentalis* Poir. in Lam. Encycl. 7: 129. 1806. *Baragueta*; *Vainilla*; *Pie de paloma*; *Canjá* (Zacapa); *Vara de laguna*.

Wet fields or thickets, often in shallow water of lake shores or along streams, 1,500 meters or less; Zacapa; Jutiapa; Santa Rosa; Guatemala; Retalhuleu; San Marcos; Huehuetenango. Florida; southern Mexico; British Honduras to Salvador and Panama; West Indies.

Plants erect, 1-3 meters high, often much branched, glabrous throughout or nearly so, the stems terete; leaflets 24-50, glaucous beneath, linear-oblong, 1.5-3 cm. long, glabrous; racemes shorter than the leaves, 2-6-flowered; calyx 8 mm. long, corolla yellow, the standard 1.5-2 cm. long; legume 15-20 cm. long, 4 mm. broad, with 30-40 seeds; seeds 3 mm. long.

Called "baripozo" and "flor de arito" in Salvador; "bequilla" (Yucatan). The plant has been reported from Guatemala as *S. macrocarpa* Muhl. and *S. exasperata* HBK. It is abundant in many regions of Guatemala during the wet season, but during the *verano* scarcely a single green plant is to be found. In very wet soil it often forms dense thickets of characteristic appearance because of the pale coloring of the foliage.

Sesbania sericea (Willd.) Link, Enum. Pl. 2: 244. 1822. *Coronilla sericea* Willd. Enum. Pl. 773. 1809.

Moist thickets or wet fields, little above sea level; British Honduras; southern Texas; West Indies; Guianas; naturalized from Ceylon.

Plants erect, annual, branched, the stems sericeous-villous; stipules subulate, 5 mm. long; leaflets 20-40, oblong, 1-2.5 cm. long, glabrous above, sericeous-villous beneath; racemes shorter than the leaves, 1-6-flowered, the flowers slender-pedicellate; calyx 5 mm. long, glabrous except on the margins, the teeth short, deltoid; corolla dull yellow, 9-12 mm. long; legume 10-16 cm. long, 3 mm. wide; seeds 20-30, about 3 mm. long.

SPARTIUM L. Spanish broom

Shrubs, the branches rush-like, usually leafless; leaves found usually only on young stems, 1-foliolate; stipules none; flowers rather large, yellow, in lax terminal racemes, the bracts and bractlets minute, caducous; calyx spathe-like, cleft dorsally, the teeth short, the 2 upper ones free, the 3 lower ones connate to form a lip; standard large, yellow, the wings obovate; keel incurved, acuminate, longer than the wings; stamens monadelphous, the alternate anthers shorter and versatile, the others longer and basifixed; ovary sessile, many-ovulate, the style incurved, glabrous, the stigma oblong, decurrent on the inner side; legume elon-

gate-linear, flat, glabrous, 2-valvate, subsepte between the seeds; seeds small, estrophiolate.

The genus consists of a single species.

Spartium junceum L. Sp. Pl. 708. 1753. *Retama*.

Native of the Mediterranean region and the Canary Islands; planted commonly in the sandy regions of San Marcos and Quezaltenango, and sometimes growing remote from dwellings, perhaps on sites formerly inhabited; recorded also from Chiantla, Huehuetenango, and probably planted in other parts of Guatemala, but not common. Thoroughly naturalized in some parts of Andean South America.

A stiff shrub 1-3 meters high, glabrous or nearly so, the branches terete, green, striate, usually leafless; leaflet 1, oblanceolate to linear, entire, bluish green, sparsely strigose, 1.2-3.5 cm. long; flowers fragrant, bright yellow, 2 cm. long or larger; standard glabrous; legume linear, pubescent or glabrous, 5-7 cm. long.

The branches contain a tough fiber, used in France and Spain for making rope, twine, and coarse cloth. The plant is grown rather commonly, especially in San Marcos, in the loose white sand prevailing over much of that department.

STYLOSANTHES Swartz

Reference: P. Taubert, Monographie der Gattung *Stylosanthes*, Abh. Bot. Ver. Brandenb. 32: 1-34. 1890.

Usually low herbs, annual or perennial, often with viscid pubescence; leaves pinnately 3-foliolate, not stipellate; stipules adnate to the base of the petiole; flowers small, yellow, in dense, chiefly terminal spikes or heads, sessile in the axis of a 2-dentate or 2-fid bract, the pedicel very short, adnate to the bract, sometimes accompanied by a stipe-like or bristle-like sterile flower; calyx tube filiform, the lobes membranaceous, the 4 upper ones connate, the lowest one narrower and distinct; petals and stamens inserted at the apex of the tube; standard orbicular, the wings oblong, the keel incurved, subrostrate; stamens monadelphous, the alternate anthers longer and subbasifixed, the others short and versatile; ovary subsessile at the base of the calyx tube, 2-3-ovulate, the style long or short, filiform, the stigma minute, terminal, the lower portion of the style persistent, recurved or revolute; legume sessile, compressed, bearing at the apex the persistent uncinat style, the joints 1-2, reticulate or muricate; seed compressed, ovate or lenticular, estrophiolate.

About 30 species, chiefly in tropical America, a few in tropical Asia and Africa. Probably only the following occur in Central America. The species are all much alike in general appearance and can be separated only with difficulty.

Beak of the fruit shorter than the terminal fertile joint; no setae present with the flower within the bract.

Flower spikes crowded into dense heads of few spikes; plants usually not densely viscid-pilose throughout but usually viscid-pilose about the inflorescence.
S. guyanensis.

Flower spikes solitary, not crowded into heads; plants densely viscid-pilose throughout. *S. viscosa*.

Beak of the fruit equaling or often much longer than the terminal fertile joint; a seta sometimes present with the flower within the bract.

Bracts accompanied within by a plumose seta; fruit densely villous. *S. eriocarpa*.

Bracts without a seta within; fruit usually glabrous or nearly so. . . . *S. humilis*.

***Stylosanthes eriocarpa* Blake, Contr. U. S. Nat. Herb. 24: 4. 1922.**

Known only from the type, collected on an open rocky hillside, trail between Los Amates and Izabal, Izabal, *S. F. Blake* 7792.

Plants frutescent, ascending, branched, 30 cm. high, the young stems densely pilose with ascending hairs; stipules 5–6 mm. long; leaflets oblong-elliptic to oblong-obovate, 3–7.5 mm. long, acute at each end, sparsely short-pilose above, paler and short-pilose beneath; flower spikes crowded in heads of 2–8; seta pilose-ciliate, shorter than the bract; calyx 6.5 mm. long, the lowest lobe obtuse; corolla 5 mm. long; fruit 8 mm. long, the sterile basal joint densely long-villous, 1.5 mm. long, the upper fertile joint villous, 3–3.5 mm. long, 1-nerved on each side and coarsely reticulate, the beak villous, uncinat, 3 mm. long.

Closely related to *S. hamata* (L.) Taub., which has been reported from Guatemala on rather doubtful evidence, and questionably distinct from it. We have seen no Guatemalan specimens surely referable to *S. hamata*, although that species is to be expected in the country.

***Stylosanthes guyanensis* (Aubl.) Swartz, Svensk. Vet. Akad. Handl. 296. 1789. *Trifolium guyanense* Aubl. Pl. Guian. 776. pl. 309. 1775. (?) *S. ingrata* Blake, Proc. Biol. Soc. Wash. 39: 51. 1926 (type from Vaca Falls District, British Honduras, *S. J. Record*). *Lengua de rana*.**

Open, often rocky slopes or plains, moist or dry fields, frequently in oak or pine forest, occasionally along sandy stream beds, 2,000 meters or lower; Alta Verapaz; Izabal; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Quiché; Quezaltenango; Retalhuleu; Suchitepéquez. Mexico; British Honduras to Salvador and Panama; South America.

Plants herbaceous or suffrutescent, erect to procumbent or prostrate, often much branched, sometimes pendent from banks, rarely as much as 1.5 meters long, generally much shorter, the stems pilose with usually long, spreading hairs, or often

glabrate; stipules 15 mm. long or less; leaflets lanceolate to oblong or linear-lanceolate, acute at each end, conspicuously nerved, more or less setose or pilose or almost glabrous, 1-5 cm. long; flower spikes densely hirsute or setose with usually viscid, yellowish hairs, grouped in terminal heads of usually 2-3 spikes; calyx 2.5 mm. long; corolla 6 mm. long, yellow or reddish yellow; lowest joint of the fruit usually abortive, the upper joint glabrous, reticulate, 3 mm. long, 2 mm. wide, the short beak 1 mm. long.

Stylosanthes humilis HBK. Nov. Gen. & Sp. 6: 506. *pl.* 594. 1824.

Dry or moist, often stony fields or plains or hillsides, often in pine-oak forest or thickets, sometimes a weed in cornfields, or on sandbars along streams, 1,400 meters or less; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Quiché; Huehuetenango. British Honduras to Panama; West Indies; South America.

Plants annual or perennial, usually herbaceous and prostrate or procumbent, sometimes erect, rarely fruticose, the stems often much branched, glabrous to pubescent or setose-hispid; leaflets narrowly oblong or lanceolate, 5-30 mm. long, acute at each end, usually strigose beneath or finally glabrate, setose-ciliate, the nerves elevated and conspicuous beneath; flower spikes small, dense, ovoid, few-flowered, usually not capitate, the bracts setose-hispid with yellowish hairs; lower joint of the fruit abortive, villous-hirsute, the upper joint 3 mm. long, 1.5 mm. wide, reticulate-nerved and costate, glabrous or hispidulous, the beak 4 mm. long, recurved-uncinate.

Stylosanthes viscosa Swartz, Prodr. Veg. Ind. Occ. 108. 1788.

Chiefly in pine forest, at or little above sea level. British Honduras; southern Mexico; probably also in other parts of Central America; West Indies; South America.

Plants erect to spreading, apparently perennial, branched, viscid-pilose or viscid-pubescent throughout, usually densely so; leaflets oblong, more or less acute at each end, mucronate, viscid-puberulent on both surfaces, usually ciliate, mostly 5-10 mm. long; spikes numerous, solitary or crowded in a short raceme, densely viscid-pilose; lower joint of the fruit abortive, densely pilose, the upper joint subtriangular, very obtuse, reticulate-nerved, 1-costate on each side, glabrate or pilose, with a very short, uncinate beak.

SWEETIA Sprengel

Unarmed trees; leaves odd-pinnate or even-pinnate, the leaflets usually rather few, coriaceous; stipules small, caducous or inconspicuous; stipels minute or none; flowers small, yellowish white, racemose, the racemes forming terminal panicles; bracts and bractlets narrow or minute, usually caducous; calyx turbinate-campanulate, the teeth or lobes subequal, valvate or subimbricate; petals all similar, free, erect-spreading, the uppermost petal outermost and sometimes

broader than the others; stamens free, subequal, longer than the petals, the filaments inflexed, the anthers uniform, ovate; ovary sessile or short-stipitate, 2-4-ovulate; style filiform, the stigma terminal, small or truncate; legume oblong, lanceolate, or broadly linear, compressed and flat, coriaceous or membranaceous, indehiscent, not winged or only obscurely so near the apex; seeds ovate or orbicular, compressed; endosperm none; cotyledons rather thick, foliaceous, the radicle short and straight or longer and incurved.

About 12 species, all except the following in South America, chiefly in Brazil.

Sweetia panamensis Benth. Journ. Linn. Soc. Bot. 8: 263. 1865. *Chichipate*; *Quina silvestre* (Alta Verapaz).

Wet mixed forest, 800 meters or less; Petén; Alta Verapaz; Izabal; Huehuetenango. Southern Mexico; British Honduras to Salvador and Panama.

An almost glabrous tree, often 20-40 meters high, the crown spreading, sometimes flat, the trunk compressed or round, with or without small buttresses, the bark light brown, rather smooth or shallowly fissured, the inner bark pale yellow to medium brown; branchlets, petioles, and branches of the inflorescence strigillose or glabrate; leaflets mostly 9-13, on rather long petiolules, ovate to oblong-lanceolate, 5-7 cm. long, gradually narrowed to the emarginate apex, obtuse at the base, subcoriaceous, lustrous, glabrous or nearly so, paler beneath, the venation prominulous and closely reticulate; flowers creamy white, 6 mm. long, in small or rather large, open panicles, short-pedicellate; calyx puberulent or almost glabrous, the lobes oblong-ovate, acute; petals long-clawed, twice as long as the calyx, glabrous; legume oblong or elliptic-oblong, 5-9 cm. long, 2 cm. wide, very thin, containing 1-3 seeds, obtuse and mucronate, acute at the base, conspicuously and laxly reticulate-veined.

Called "Billy Webb" in British Honduras; "guayacán" (Veracruz, Oaxaca). The flowers are fragrant. The wood is brown, with lighter and darker shades, lustrous, the sapwood yellowish or nearly white, sharply defined; hard and heavy, the specific gravity about 1.00; weight about 62 pounds per cubic foot; grain finely roey, the texture rather fine; tough and strong, easy to saw but rather difficult to finish, takes a high polish, is considered very durable; has a rather unpleasant odor when freshly cut. It is employed in Guatemala or neighboring regions for general construction, sugar mills, railroad ties, carts, tool handles, and bridge construction. The tree abounds in many parts of the Atlantic lowlands of Central America and in some places along the Pacific coast. The bark is reported to be bitter and to be utilized in Salvador and Alta Verapaz as a domestic medicine for treating malaria. By Tejada this tree has been reported from Zacapa, Jutiapa, Chiquimula, Santa Rosa, Guatemala, and Suchitupéquez, in all of which it may well occur.

TEPHROSIA Persoon

Annual or perennial herbs or sometimes shrubs; leaves odd-pinnate, the lateral nerves usually prominent beneath, very oblique, and parallel; stipules setaceous or broader, striate; flowers small to rather large, racemose, either terminal and with or without smaller racemes in the upper leaf axils, or apparently opposite the leaves, or sometimes axillary; bractlets none; calyx campanulate, the lobes subequal or the lowest one longer, the upper 2 usually more or less connate; petals unguiculate, the standard suborbicular, more or less sericeous outside; vexillar stamen at first free at the base but united above with the others, in anthesis free, the anthers uniform; ovary sessile, many-ovulate; style inflexed or incurved, usually glabrous, the stigma terminal; legume sessile, compressed and flat, 2-valvate, many-seeded; seeds sometimes strophiolate.

Species 125 or more, in both hemispheres, most plentiful in tropical or subtropical regions. A few additional species may occur in Central America.

Leaflets 5-7, mostly 2-4 cm. wide, densely tomentose beneath. *T. lanata*.

Leaflets numerous or, if few, 5 mm. wide or narrower.

Racemes terminal and axillary, not opposite the leaves; leaflets 11-41; corolla usually 1.5-2 cm. long.

Leaflets coriaceous, green above and glabrous or essentially so, usually distinctly broadest toward the apex. *T. nitens*.

Leaflets relatively thin, variously pubescent on the upper surface, or rarely glabrous, broadest at or near the middle.

Leaflets glabrous on the upper surface, 5-15. *T. belizensis*.

Leaflets copiously pilose or sericeous on the upper surface.

Leaflets 15-21, rounded at the base, mostly 12-15 mm. wide.

T. nicaraguensis.

Leaflets 21-29, obtuse at the base, mostly 5-8 mm. wide. . *T. Heydeana*.

Racemes opposite the leaves; leaflets 5-11; corolla usually 12 mm. long or shorter.

Pubescence of the stems closely appressed.

Leaflets obovate or cuneate-oblong, rounded or retuse at the apex.

T. cathartica.

Leaflets linear-oblongate, obtuse or acute. *T. cinerea*.

Pubescence of the stems spreading.

Lobes of the calyx conspicuously longer than the tube.

Leaflets oblanceolate or narrowly cuneate-oblong, 1-2 cm. long.

T. decumbens.

Leaflets linear-oblong or oblong, most of them more than 2 cm. long.

T. littoralis.

Lobes of the calyx about equaling the tube. *T. vicioides*.

Tephrosia belizensis Lundell, Bull. Torrey Club 64: 550. 1937.

British Honduras, El Cayo District, the type collected on open rocky bank of Río Frío, near San Agustín, C. L. Lundell 6662.

A slender erect perennial 50–70 cm. high, the stems hirsute; leaflets 5–15, lanceolate or ovate-lanceolate, 2–6 cm. long, 7–21 mm. wide, acuminate, obtuse at the base, dark green, lustrous, and glabrous above, densely silvery-strigose beneath, the lowest leaflets much reduced, ovate-oval; racemes terminal and axillary, the bracts linear-lanceolate, 7 mm. long or less; calyx densely fulvous-pilose, the tube 3.5 mm. long, the lobes lanceolate, attenuate, 2–5 mm. long, very unequal; corolla 13–16 mm. long; legume 6–7 cm. long, 6 mm. wide, brown-hirsute.

Tephrosia cathartica (Sessé & Moc.) Urban, Symb. Antill. 4: 283. 1905. *Galega cathartica* Sessé & Moc. Fl. Mex. ed. 2. 175. 1894. *Cracca cathartica* Britton & Millsp. Bahama Fl. 181. 1920.

British Honduras (Seine Bight, open places, *Schipp* 670); Yucatan; islands of Honduras; West Indies; Colombia.

Plants perennial, erect or ascending, herbaceous, the stems 30–50 cm. long, strigose; stipules subulate, 4–7 mm. long; leaflets 5–7, obovate or cuneate-oblong, 1–3 cm. long, rounded or retuse at the apex, cuneate at the base, strigose on both surfaces, pale; racemes opposite the leaves, 5–15 cm. long, lax, few-flowered; bracts subulate, 7–10 mm. long; calyx strigose, the tube 2 mm. long, the lobes lance-subulate, 3 mm. long; corolla rose-purple, 7–10 mm. long; legume 3–5 cm. long, 4–5 mm. wide, strigose, 6–8-seeded; seeds brownish, 3.5–4 mm. long.

According to the original label of Sessé and Mociño, who collected the type in Puerto Rico at the end of the eighteenth century, the plant was known there as “hojasén” and was used as a cathartic medicine.

Tephrosia cinerea (L.) Pers. Syn. Pl. 2: 328. 1807. *Galega cinerea* L. Syst. Nat. ed. 10. 1172. 1759. *Cracca cinerea* Morong, Ann. N. Y. Acad. Sci. 7: 79. 1892.

Reported by Rydberg from Guatemala, the locality not indicated. Chiapas; Yucatan; West Indies; South America.

Plants perennial, herbaceous from a woody root, the stems prostrate or ascending, 30–60 cm. long, strigose, often much branched; stipules acuminate, persistent, 3–8 mm. long; leaflets 9–17, linear-ob lanceolate or oblong-ob lanceolate, 2–5 cm. long, 4–8 mm. wide, obtuse or subacute, acute at the base, sparsely strigose or glabrate above, cinereous-strigose beneath; racemes opposite the leaves, lax, 5–10 cm. long, the bracts subulate or setaceous, persistent; calyx strigose, the tube 2 mm. long, the subulate lobes 3 mm. long or longer; corolla purplish, 10–15 mm. long; legume 4–5 cm. long, 4–5 mm. wide, strigose, 6–12-seeded; seeds brown, mottled, 4 mm. long.

Called “zulche” or “sulche” in the Maya language of Yucatan. This plant and related species have been used in the Guianas and doubtless elsewhere as a fish poison. In Australia the related *T. purpurea* (L.) Pers. has been reported as poisonous to stock.

Tephrosia decumbens Benth. ex Oerst. Vid. Medd. 7. 1853.
Cracca decumbens Kuntze, Rev. Gen. 1: 174. 1891.

Sandy fields or plains, sometimes on sandbars along streams or near the seashore, 200 meters or less; Zacapa; San Marcos. Southern Mexico; Honduras; Nicaragua (type from Granada); Costa Rica; northern South America.

Perennial from a woody root, the stems procumbent, 25–50 cm. long, densely pilose, often flexuous; stipules subulate, 3–5 mm. long; leaflets 5–11, oblanceolate or cuneate-oblong, 1–2 cm. long, 4–7 mm. wide, obtuse or retuse at the apex, densely sericeous-pilose on both surfaces, grayish; racemes opposite the leaves, short and few-flowered, the lowest bract often foliaceous and pinnate, the others lance-subulate; calyx pilose, the tube 1.5–2 mm. long, the lobes subulate-setaceous, 3 mm. long; corolla purple, 8–10 mm. long; legume 3–4 cm. long, 4 mm. wide, densely short-villous with spreading hairs, 7–9-seeded; seeds oblong, 3 mm. long, subtruncate at each end.

This is very closely related to *T. cinerea* and *T. littoralis*. All these small-flowered *Tephrosia* species are, indeed, too closely related, and it is questionable whether they should be treated as numerous species based upon trivial characters or as forms or varieties of one highly variable species.

Tephrosia Heydeana (Rydb.) Standl. Journ. Wash. Acad. Sci. 17: 167. 1927. *Cracca Heydeana* Rydb. N. Amer. Fl. 23: 166. 1923. *Chilapate* (Jutiapa); *Barbasco*; *Hierba de zope* (fide Aguilar).

Moist or wet thickets, sometimes in pine-oak forest, 2,000 meters or lower; Jutiapa; Santa Rosa (type from Teocinte, *Heyde & Lux* 6111); Guatemala; Sololá; Huehuetenango. Honduras and Salvador to Panama.

A stout erect herb or shrub, 1–2.5 meters high, the stems angulate, usually densely pilose with brownish hairs; stipules subulate, 3–5 mm. long; leaflets 21–29, narrowly oblong, rather thin, 2–4 cm. long, 7–12 mm. wide, green and sparsely sericeous above, pale beneath and densely sericeous; racemes terminal and from the upper leaf axils, 10–20 cm. long, rather lax, many-flowered; bracts subulate, 8–10 mm. long; calyx sericeous, the tube 2.5 mm. long, the lobes subulate-acuminate, 3 mm. long; corolla pale green, greenish pink, or rose-purple, 1.5 cm. long; legume 5–6 cm. long, 4 mm. wide, densely short-pilose, 6–9-seeded; seeds brown, 3 mm. long.

This is said to be the most efficient fish poison of the Oriente of Guatemala. It is closely related to *T. toxicaria* (Swartz) Pers., which has a wide distribution in tropical America and has been much used for the same purpose. *T. toxicaria* may well occur in Guatemala, since it grows in both Mexico and southern Central America, but we have seen no local collections. An infusion of *T. Heydeana*

is employed in Huehuetenango and perhaps elsewhere to destroy insect pests on domestic animals.

Tephrosia lanata Mart. & Gal. Bull. Acad. Brux. 10, pt. 2: 48. 1843. *Chorreeque*.

Open pine-oak forest, usually in dry rocky places, 1,200–1,800 meters; Zacapa; Chiquimula; Jalapa. Western and southern Mexico.

An erect herb or shrub, a meter high or less, the stout stems densely villous-tomentose with brownish hairs; stipules lanceolate, villous, 5–10 mm. long; leaflets 5–9, oblong to oval, 4–8 cm. long, 1.5–4 cm. wide, rounded or very obtuse at each end, thick, densely pilose above or finally glabrate, densely tomentose beneath with long interlaced hairs; racemes terminal and in the upper leaf axils, 5–10 cm. long, dense and many-flowered; calyx villous, the tube 2 mm. long, the lobes lanceolate, 5 mm. long, acuminate; corolla deep pink or rose-purple, 12–14 mm. long; legume 3–4 cm. long, 6 mm. wide, densely fulvous-villous.

Tephrosia littoralis (Jacq.) Pers. Syn. Pl. 2: 329. 1807. *Vicia littoralis* Jacq. Enum. Pl. Carib. 27. 1760.

Moist fields or hillsides, chiefly in open places, sometimes in thickets or pine forest, 600 meters or less; Petén; Izabal; Zacapa; Chiquimula; Jutiapa; Guatemala. Southern Mexico; British Honduras; West Indies; South America.

A perennial herb, prostrate to erect, the stems a meter long or less, angulate, sparsely or densely pilose with short or rather long, spreading hairs; stipules subulate, 5–10 mm. long; leaflets 7–17, oblong to linear-oblanceolate or almost linear, 1–5 cm. long, 3–12 mm. wide, obtuse or rounded at the apex, acutish at the base, glabrous and green above or sparsely pilose, sericeous-pilose beneath; racemes slender, lax, few-many-flowered, 7–20 cm. long, the bracts subulate; calyx hirsute, the tube 2–3.5 mm. long, the lobes 4–5 mm. long, subulate; corolla 1 cm. long, purple; legume 4–5 cm. long, 4 mm. wide, short-pilose; seeds 8–10, somewhat truncate at each end, 3 mm. long.

The local material referred here is variable and may be divisible into two or more species. •

Tephrosia nicaraguensis Oerst. in Benth. & Oerst. Vid. Medd. 6. 1853. *Cracca nicaraguensis* Kuntze, Rev. Gen. 1: 175. 1891.

Open, often rocky, pine-oak forest, 900–1,400 meters; Chiquimula; Jutiapa; Huehuetenango. Nicaragua (type collected between Granada and Masaya); Costa Rica.

An erect perennial, 75 cm. high or less, herbaceous or suffrutescent, the stems simple or branched, angulate, densely fulvous-villous; stipules subulate, 6–10 mm. long; leaflets 15–21, oblong or oval, 2–4 cm. long, rounded at each end, densely

sericeous-villous on both surfaces, or sometimes glabrate above, thick, the lateral nerves prominent beneath; racemes mostly shorter than the leaves, terminal, the bracts setaceous; calyx villous, the tube 2-3 mm. long, the lobes lanceolate, acuminate, unequal; corolla 12 mm. long; legume 4 cm. long, 4 mm. wide, densely villous.

***Tephrosia nitens* Benth.** in Seem. Bot. Voy. Herald 107. 1853.
***Cracca nitens* Kuntze,** Rev. Gen. 1: 175. 1891.

In savannas or pine forest, 600 meters or less; Chiquimula (between Jocotán and Chiquimula, *Steyermark* 31747). Southern Mexico; British Honduras; Panama; South America.

Plants erect, herbaceous or frutescent, a meter high or less, the stems simple or branched, terete, densely sericeous-pilose with white hairs; leaves sessile or nearly so; leaflets 9-13, narrowly oblong or oblong-oblancheolate, 4-5.5 cm. long, 6-20 mm. wide, rounded and retuse or apiculate at the apex, attenuate to the base, coriaceous, green and glabrous above, pale beneath, densely silvery-sericeous; racemes terminal and often in the upper leaf axils, 10-30 cm. long, many-flowered, interrupted, the bracts lance-acuminate; calyx white-sericeous, the tube 3 mm. long, the lobes lance-subulate, 4-5 mm. long; corolla rose-purple, 2 cm. long; legume 5-6 cm. long, 5-6 mm. wide, 8-10-seeded, velutinous-pilose; seeds 2.5-3 mm. long, mottled with olive and brown.

***Tephrosia vicioides* Schlecht.** *Linnaea* 12: 297. 1838.

Moist or dry, rocky slopes or plains, sometimes on sandbars along streams, 200-300 meters; Zacapa. Southern Mexico.

Plants perennial, slender, erect or spreading, 50 cm. high or less, the stems slender, angular, sparsely pilose with short spreading hairs, or sometimes densely short-pilose; stipules setaceous, 5-8 mm. long; leaflets mostly 15-21, oblanceolate to almost linear, 1-3 cm. long, 8 mm. wide or usually narrower, obtuse or acutish, mucronate, glabrous above or nearly so, sparsely sericeous-strigose beneath; racemes slender, few-flowered, terminal and in the upper leaf axils, 15 cm. long or shorter, the bracts setaceous, persistent; calyx pilose, the tube 2 mm. long, the lobes subulate, 2.5 mm. long; corolla 6 mm. long, purple or pink; legume about 4 cm. long and 4 mm. wide, strigose, 7-8-seeded.

Tephrosia Vogelii Hook. f., native of tropical Africa, has been tested on a small scale in Central America as a possible cover plant or green manure. It was observed in cultivation at Finca Monterrey, Escuintla, and Finca El Naranjo, Suchitepéquez, and may persist after cultivation. It can be recognized easily by its large leaflets, very large, pure white flowers, and thick pods, about 1.5 cm. wide.

***Tephrosia* sp.** There has been collected in Huehuetenango (between Chanquejervé and Ixcacao, *Steyermark* 51790) another

species of this genus, probably undescribed, but the material is sterile and unsuited for naming. It is a coarse prostrate perennial; leaflets coriaceous, 5-7, obovate-oval to obovate-oblong, 3-5 cm. long, rounded at the apex, obtuse or rounded at the base, thinly sericeous beneath and with sparse appressed hairs on the upper surface.

TERAMNUS Swartz

Twining herbs with slender stems, usually densely pubescent; leaves pinnately 3-foliate, stipellate; stipules small; flowers very small, purplish, fasciculate in the leaf axils or scattered along the axis of an axillary raceme, the bracts small; bractlets linear or lanceolate; upper 2 calyx lobes connate or distinct; standard obovate, narrowed at the base, not appendaged, the wings narrow, adherent to the keel; keel shorter than the wings, almost straight, obtuse; stamens monadelphous, the alternate anthers minute, sterile; ovary sessile, many-ovulate, the style short, thick, not barbate, the stigma capitate; legume linear, 2-valvate, straight or slightly falcate, septate within between the seeds; style uncinata.

About 4 species, in tropical regions. Only the following are known from North America.

Leaflets oblong or lanceolate, 5-8 cm. long; legume usually 5-7 cm. long.

T. uncinatus.

Leaflets ovate to elliptic or suborbicular, mostly 1-4 cm. long; legume usually 2-4 cm. long. *T. labialis.*

Teramnus labialis (L. f.) Spreng. Syst. 3: 235. 1826. *Glycine labialis* L. f. Suppl. Pl. 325. 1781.

Brushy slopes, moist fields, moist cliffs, or in pine-oak forest, 1,200-2,400 meters; Guatemala; Sacatepéquez; Chimaltenango; Huehuetenango; Quezaltenango. West Indies; Old World tropics.

Stems slender, twining or prostrate, short-pilose or glabrate; stipules lanceolate or ovate-lanceolate, 3 mm. long; leaflets ovate to oval or rounded, thin, 2-5 cm. long, sparsely appressed-pilose on the upper surface or glabrate, sparsely or rather densely appressed-pilose beneath, rounded or obtuse at each end; racemes slender, few-flowered, about as long as the leaves; calyx 4 mm. long, pilose, the 5 lobes linear, subequal, equaling or shorter than the tube; corolla slightly longer than the calyx; legume 2-5 cm. long, 3 mm. wide, sparsely or densely short-pilose, short-rostrate, compressed; seeds oblong-quadrate, dark brown, 1.5-2.5 mm. long.

Teramnus uncinatus (L.) Swartz, Prodr. Veg. Ind. Occ. 105. 1788. *Dolichos uncinatus* L. Sp. Pl. ed. 2. 1019. 1763. *Calopogonium phaeophlebium* Donn. Smith, Bot. Gaz. 52: 46. 1911 (type from Laguna de Ayarza, Jalapa, Heyde & Lux 3742). *Mielito*; *Frijolillo*.

Dry to wet thickets, often in pine-oak forest, 1,800 meters or less; Baja Verapaz; Chiquimula; Jalapa; Jutiapa; Santa Rosa;

Guatemala; Sacatepéquez; Retalhuleu. Southern Mexico; Salvador to Panama; West Indies; South America.

A slender herbaceous vine, twining over shrubs or coarse herbs, the stems densely pilose with reflexed hairs; stipules lanceolate, 3–5 mm. long; leaflets oblong to linear-lanceolate, 5–8 cm. long, acute or obtuse, green above, rather densely strigose, pale beneath, densely sericeous; racemes very slender and remotely flowered, generally much longer than the leaves, or some of the flowers solitary in the leaf axils; calyx pilose, 5–6 mm. long, the 5 lobes narrow, subequal, longer than the tube; corolla purplish or whitish, little longer than the calyx; legume 4–7 cm. long, 3–4 mm. wide, densely brown-pilose, the beak 3–5 mm. long; seeds numerous, oblong, brownish, lustrous, 3 mm. long.

Known in Salvador by the names “mozote” and “bejuco de chonchito.” The plant is a distinctly weedy one, sometimes common in second growth or fallow fields.

TRIFOLIUM L. Clover

Annual or perennial herbs; leaves mostly digitately 3-foliate, the leaflets often denticulate; stipules adnate to the petiole; flowers small or rather large, mostly purple, red, or white, sometimes yellow, spicate, capitate, or umbellate, the peduncles axillary or pseudoterminal; bracts small or none, sometimes membranaceous, persistent or deciduous; calyx teeth or lobes equal or the lower ones longer, the 2 upper ones sometimes connate; petals usually marcescent, the claws of all or some of them adnate to the stamen tube; standard oblong or ovate, the wings narrow; keel shorter than the wings, obtuse; vexillar stamen usually free, some or all of the filaments sometimes dilated, the anthers uniform; ovary sessile or stipitate, few-ovulate, the style filiform, incurved above, the stigma capitate; legume oblong and subterete or compressed-obovate, included in the calyx or the marcescent petals, usually membranaceous, indehiscent; seeds 1–2, estrophiolate.

Perhaps 300 species, of wide distribution but chiefly in temperate regions. Only two species are native in Central America.

Flowers sessile, the head sessile, subtended at the base by a leaf. . . . *T. pratense*.
Flowers umbellate, the umbels long-pedunculate, not subtended by a leaf.

Calyx glabrous, the teeth equaling or shorter than the tube. *T. repens*.

Calyx pilose, the teeth much longer than the tube.

Leaflets about 1 cm. long, broadly rounded at the apex; umbels of flowers about 1 cm. broad. *T. amabile*.

Leaflets mostly 2–3 cm. long, those of the upper leaves acute or subacute; umbels about 2 cm. broad. *T. mexicanum*.

Trifolium amabile HBK. Nov. Gen. & Sp. 6: 503. 1824.
Trébol de oveja (fide Aguilar).

Mostly in moist mountain meadows, often in pine-oak forest, frequent on exposed banks, 1,600–3,400 meters; Jalapa; Guatemala;

Sacatepéquez; Chimaltenango; Sololá; Quiché; Huehuetenango; San Marcos; Quezaltenango. Mexico; Costa Rica.

Plants perennial, usually from a thick deep taproot, the stems slender, prostrate, mostly 40 cm. long or less, thinly villous; stipules large, acuminate, striate, conspicuous; leaflets broadly cuneate-obovate, mostly 6–15 mm. long, rounded or emarginate at the apex, striate-nerved, serrulate or entire, glabrous or sparsely pilose beneath along the costa, paler beneath; peduncles slender, often much longer than the leaves, sometimes short, the umbels few-flowered, the flowers short-pedicellate, purple, about 5 mm. long; calyx villousulous, the lobes subulate, about twice as long as the tube; corolla little longer than the calyx.

A characteristic plant of the meadows of the central and western mountains, often occurring in great abundance at middle and high elevations.

Trifolium mexicanum Hemsl. Biol. Centr. Amer. Bot. 1: 233. 1880.

At 2,500–3,100 meters; Huehuetenango (Nucá; San Mateo Ixtatán). Central and southern Mexico.

An erect or ascending, perennial herb, usually 30 cm. high or less, the stems stout, sparsely branched, glabrous; stipules green, about 1.5 cm. long, entire or serrulate, setaceous-acuminate; leaves long-petiolate, the leaflets ovate-oblong to lance-oblong, mostly 2–3 cm. long and acute, serrulate, glabrous or nearly so; flowers dull white or greenish white, 8–10 mm. long, pedicellate, the umbels 20–40-flowered, not bracteate, the flowers reflexed in age; calyx lobes setaceous-subulate, three times as long as the short tube, sparsely pilose or almost glabrous.

Trifolium pratense L. Sp. Pl. 768. 1753. *Red clover*.

Native of Europe and Asia, naturalized abundantly in the United States; seen in Guatemala only about Quezaltenango (2,300–2,400 meters), where it is scarce; reported as collected in alfalfa field, Santa Lucía Utatlán, Sololá.

Plants perennial, erect or ascending, 50 cm. high or less, branched, softly pilose or villous; stipules large and conspicuous; leaflets oval to broadly elliptic or obovate, 1–5 cm. long, obtuse or rounded at the apex, finely denticulate, often with a large dark spot near the middle; heads very dense and many-flowered, globose or ovoid, about 2.5 cm. long; flowers red-purple, sessile, 12 mm. long; calyx pilose, the teeth subulate, shorter than the corolla.

Red clover is little known in Central America but in Guatemala it has been planted experimentally, and there is no apparent reason why it should not succeed. An experimental plot was observed by the senior author at Finca La Alameda near Chimaltenango. Although stock had eaten all other green vegetation in the vicinity, they had left the clover severely alone. In the United States red

clover is an important hay and forage plant, and vast quantities are produced every year. The hay is considered one of the best for horses and cattle, having a high nutritive value. The flowers are an important source of honey.

Trifolium repens L. Sp. Pl. 767. 1753. *White clover*.

Native of Europe and Asia, extensively naturalized over most of the United States; observed in Guatemala only about Quezaltenango (2,250–2,400 meters), where in some localities it is abundant, growing in boggy places and forming a dense sod.

Plants perennial, creeping, much branched, glabrous or nearly so; leaves long-petiolate, the stipules ovate-lanceolate, membranous; leaflets obovate or rounded-obovate, 1–2 cm. long, rounded or emarginate at the apex, denticulate; umbels dense and many-flowered, long-pedunculate; flowers white or pinkish, 6–10 mm. long, finally reflexed; calyx teeth narrow, acuminate, somewhat shorter than the tube; corolla 2–3 times as long as the calyx, legume about 4-seeded.

White clover has become well naturalized in the mountain pastures of Costa Rica. In the United States it is one of the most common and familiar plants, to be found in almost any dooryard. It is much planted for lawns, and to some extent for pasture. The plants are too small to be cut for hay. The flowers supply a superior grade of honey.

VATAIREA Aublet

Trees, often leafless during the flowering and fruiting seasons; stipules small, deciduous; leaves alternate, crowded at the ends of the branches, odd-pinnate, the leaflets alternate, not stipellate; flowers rather small, in large terminal panicles; bracts and bractlets small; calyx campanulate, acute at the base, shallowly and equally 5-dentate; petals violaceous, glabrous, unguiculate, about equal in length; standard orbicular or obovate, the wings oblong, the keel falcate-oblong; stamens monadelphous, the anthers versatile; ovary subsessile or short-stipitate, 1–8-ovulate; legume indehiscent, samaroid, with a large terminal transverse-striate wing, or the fruit sometimes orbicular and corky and with only a rudimentary wing; seed 1, large, without endosperm.

About 8 species, the others in the Guianas and Brazil.

Vatairea Lundellii (Standl.) Killip ex Record, Trop. Woods 63: 5. 1940. *Tipuana Lundellii* Standl. Carnegie Inst. Wash. Publ. 461: 65. 1935. *Palo de zope*; *Palo negro*; *Guacamayo*.

In savannas or on limestone hillsides, sometimes on thinly forested, alluvial plains, 200 meters or less; Petén (type from La Libertad, C. L. Lundell 2895); Izabal; Retalhuleu. Veracruz; British Honduras; Honduras.

A giant tree, sometimes 30 meters high with a trunk a meter in diameter, often supported by narrow buttresses 2 meters high or less, the bark fairly smooth, reddish or dark brown, sometimes light gray, the inner bark deep pink; leaflets 11-15, alternate, petiolulate, elliptic or oblong-elliptic, 2.5-5 cm. long, 1.5-2 cm. wide, somewhat narrowed to the truncate or broadly excised apex, rounded or obtuse at the base, thick, green and glabrous above, slightly paler beneath, sericeous at first but soon glabrate; panicles large, rather open, many-flowered, the branches brown-pubescent, the flowers fragrant, slender-pedicellate; calyx turbinate, 6 mm. long, brown-sericeous, the limb spreading; petals white, faintly tinged with purple, 1.5 cm. long; legume short-stipitate, samaroid, 10-13 cm. long, the seed-bearing part thick, 2.5 cm. wide, the wing 2.5-3 cm. wide, rather thin, glabrous or nearly so.

Called "picho" in Veracruz. The sapwood is creamy white, the heartwood yellowish brown, darkening on exposure to air; has a disagreeable odor when freshly cut. In Veracruz it is employed for general construction, also for house posts and canoes. The tree is said to be common there, growing in low, periodically inundated land and on well-drained slopes.

VICIA L.

Herbs, usually with tendrils; leaves pinnate, the rachis of some or all the leaves terminating in a simple or branched tendril, the leaflets numerous, rarely only 1-2 pairs, entire or dentate at the apex, not stipellate; stipules semisagittate; flowers mostly blue, violaceous, or ochroleucous, sometimes solitary or fasciculate in the leaf axils, sometimes in axillary racemes; bracts caducous, usually minute; bractlets none; calyx tube oblique and obtuse at the base, the teeth subequal or the 2 upper ones short and the lowest one longer; standard obovate or oblong, emarginate, unguiculate, the wings oblique-oblong; keel shorter than the wings, falcate-oblong or broad; stamens diadelphous, the anthers uniform; ovary sessile or stipitate, many-ovulate or rarely 2-ovulate; style inflexed, filiform, pilose dorsally at the apex, or pubescent or pilose on all sides, the stigma terminal; legume compressed, 2-valvate, continuous within; seeds globose or compressed; cotyledons thick, the radicle inflexed.

Perhaps 150 species, of wide distribution, chiefly in temperate regions. No others are known in Central America, and only one is native there.

Leaves without tendrils; leaflets mostly 2 cm. wide or larger; seeds 2-2.5 cm. long.

V. Faba.

Leaves, at least some of them, terminating in tendrils; leaflets mostly 7 mm. wide or smaller; seeds small.

Flowers in many-flowered racemes. *V. villosa.*

Flowers solitary or fasciculate in the leaf axils or the peduncles 2-flowered.

Flowers sessile or nearly so; valves of the legume very convex. *V. angustifolia.*

Flowers long-pedunculate; valves of the legume flat. *V. humilis.*

***Vicia angustifolia* L. Amoen. Acad. 4: 105. 1759.**

Sandy fields or waste ground, sometimes a weed in gardens, occasionally in oak forest, 1,500–2,700 meters; Chimaltenango; Quezaltenango; San Marcos. Native of Europe, but often naturalized in North America as well as in other regions.

Plants slender, annual, glabrous or puberulent, the stems 25–50 cm. long; stipules semisagittate, dentate or entire; leaves short-petiolate or almost sessile, most of them terminating in a tendril; leaflets 4–16, linear to lanceolate or narrowly oblong, 8–20 mm. long, acute to emarginate and mucronate; flowers 1–2 in the upper axils, sessile or nearly so, 12–18 mm. long, purple; teeth of the calyx equaling or shorter than the tube; legume linear, glabrous, 2.5–5 cm. long, 5–7 mm. wide, containing few, rather large seeds.

***Vicia Faba* L. Sp. Pl. 737. 1753. *Haba*. Broad bean; Horse bean.**

Native of the Old World, probably of northern Africa and southwestern Asia; planted abundantly in the mountains of Guatemala at middle and rather high elevations.

A stout erect annual a meter high or less, densely leafy, glabrous or nearly so, the stems angulate; leaflets 1–3 pairs, oval to elliptic, large, the terminal one none or represented by a rudimentary tendril, obtuse, mucronate, usually blackening when dried; flowers axillary, sessile or nearly so, large, dull white, the standard with a large blue-black spot; legume large, thick, 5–8 cm. long or more; seeds large, compressed, very hard, with a large hilum.

The *haba* is one of the best-known cultivated plants of the Guatemalan highlands, and is an important source of food, especially among the Indians of Los Altos. It is planted and harvested during the rainy season, and growing plants are seldom found in the *verano*. The crop of the year 1938–39 is estimated at 4,040,500 pounds, a rather formidable amount, considering that there are large areas of the country where the *haba* is unknown. More than half this amount was produced in Quezaltenango, other departments with important quantities being Totonicapán, San Marcos, Sacatepéquez, and Chimaltenango. A few were grown even in Alta Verapaz. Most *habas* are consumed by the Indian population; they find little favor among the *ladinos*, although occasionally the green seeds are served upon the table in the hotels. If badly cooked the green seeds are very bad indeed, and at best they are a rather sorry dish, lacking in flavor. The roasted dry seeds are offered in the markets of the highlands in vast quantities, especially in the *ferias*, where they take the place occupied by peanuts in the United States. The roasted seeds are so hard that they must be held in the mouth a long time before

they can be chewed and swallowed. Children seem to be particularly fond of them, and the deplorable condition of the children's teeth may be in part a result of the custom, although it must be admitted that bad teeth prevail in many parts of Central America where *habas* are not eaten. The dry seeds of the markets are either dull green or purple. No attention seems to be paid to color in cultivation or marketing, and the two forms often are mixed.

***Vicia humilis* HBK. Nov. Gen. & Sp. 6: 498. 1824.**

Dry rocky hillsides, 1,900–2,400 meters; Huehuetenango; Quezaltenango (Cerro La Pedrera, south of Quezaltenango). Mexico.

Plants very slender, sparsely pilose or puberulent or almost wholly glabrous; leaflets usually 4, linear to linear-oblong, 1–3 cm. long, obtuse or acute and mucronate, thin, the lateral nerves very oblique; peduncles sometimes 1.5 cm. long but usually shorter, 1–2-flowered; flowers pale bluish, 8 mm. long; calyx sparsely pilose, the lobes narrowly lanceolate, attenuate, about as long as the tube; legume 2–2.5 cm. long, 6 mm. wide, glabrous, acute and short-rostrate, the valves flat; seeds 2.5 mm. long, subglobose, almost black.

***Vicia villosa* Roth, Tent. Fl. Germ. 2: 182. 1789.**

Native of Europe, but sometimes planted in other regions, and naturalized in some regions of North America; occasionally established as a weed in thickets or cultivated ground, about 1,800 meters; Guatemala; Chimaltenango (near Chimaltenango, Tecpám, and Patzicía).

Annual or perennial, often scandent, abundantly pilose throughout with weak spreading whitish hairs; leaflets 8–10 pairs, linear to oblong, 1–3 cm. long, rounded to acute and mucronate at the apex, thin; racemes densely many-flowered, one-sided, on long or short peduncles, the flowers violet or purple, 1.5 cm. long; calyx sparsely villous, the teeth very unequal, the longest about equaling the tube; legume oblong, 2–3 cm. long, 7–10 mm. wide, glabrous, very obtuse, the valves somewhat convex; seeds small, globose, black.

The plant is a showy and rather handsome one. In the United States it is sometimes grown as a cover crop, and the plants seen in Chimaltenango probably are relics of former cultivation there.

VIGNA Savi

Herbs, erect or scandent; leaves pinnately 3-foliolate, stipellate; stipules sessile or sometimes produced below the point of insertion; flowers generally yellow, the peduncles axillary, elongate, the flowers in a short, sometimes umbelliform raceme at its apex; bracts and bractlets small, caducous; upper 2 calyx lobes or teeth connate or distinct; standard orbicular, with inflexed basal auricles, the wings falcate-obovate, slightly shorter than the standard; keel equaling

the wings, incurved, not rostrate or with a short incurved beak; vexillar stamen free, the others connate, the anthers uniform; ovary sessile, many-ovulate, the style filiform or thickened above, often barbate along the inner side, the stigma oblique; legume linear, straight or nearly so, subterete, 2-valvate, interrupted within between the seeds; seeds reniform or subquadrate, the hilum lateral, short, not strophiolate.

About 40 species, in the tropics of both hemispheres. Only the following are known from Central America.

Stipules produced at the base below the point of insertion; legume 10–40 cm. long; cultivated plants.

Seeds elongate-reniform, 8–12 mm. long, much longer than broad; legume commonly 30–60 cm. long, becoming somewhat inflated, flabby and pale before ripening, somewhat constricted between the seeds when dry.

V. sesquipedalis.

Seeds subreniform to subglobose, 6–9 mm. long; legume mostly 20–30 cm. long, not at all flabby or inflated when green. *V. unguiculata.*

Stipules not produced below the point of insertion; legume usually much smaller; native plants.

Calyx 4-dentate, 4–5 mm. long; keel petal not calcarate. *V. luteola.*

Calyx 5-dentate or lobate, about 1 cm. long; keel petal calcarate on one side. *V. vexillata.*

Vigna luteola (Jacq.) Benth. in Mart. Fl. Bras. 15, pt. 1: 194. *pl. 50, f. 2.* 1859. *Dolichos luteolus* Jacq. Hort. Vindob. 1: 399. *pl. 90.* 1770. *D. repens* L. Syst. Nat. ed. 10. 1163. 1759. *V. repens* Kuntze, Rev. Gen. 1: 212. 1891, not Baker, 1876. *Calopogonium pedunculatum* Standl. Carnegie Inst. Wash. Publ. 461: 61. 1935 (type from Campeche). *Frijol de arena; Caupt de monte; Frijol de monte; Frijol de cabra.*

Moist or wet thickets, often in marshes or bogs, often in *Salix* thickets along streams, 1,450 meters or less; Petén; Alta Verapaz; Izabal; Zacapa; Chiquimula; Jalapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Quiché; Suchitepéquez; Retalhuleu. Southern Mexico; British Honduras to Panama; West Indies; South America; Old World tropics.

A small or large vine, the stems slender, glabrous or hirsute-pilose, twining or trailing over the ground and sometimes rooting at the nodes, often forming dense tangles over the ground or over shrubbery; stipules 5 mm. long or less; leaflets ovate to lanceolate or elliptic, acute or acuminate, sometimes obtuse, rounded to cuneate at the base, 3–9 cm. long, glabrous or sparsely pilose, often rather thick and slightly fleshy; peduncles usually much longer than the leaves, as much as 20 cm. long, the flowers few, crowded at the apex, the pedicels 2 mm. long, the bracts and bractlets small; calyx campanulate, 4–5 mm. long, 4-dentate, the 3 lower teeth acute, shorter than the tube; petals dull yellow or greenish yellow, the standard about 1.5 cm. long; keel semiorbicular, subrostrate, obtuse; legume linear,

pilose with sparse, fulvous, appressed or spreading hairs, 4-7 cm. long, 5-7 mm. wide; seeds 8-12, black, lustrous, 4-5 mm. long, the hilum white, oblong.

Called "frijol de playa" in Honduras, the plant often occurring in coastal thickets. It often is abundant in marshes along the coastal plains, frequently growing in shallow water. It is characteristic also of the floating bogs found in some of the small Guatemalan lakes. The species has been reported from Guatemala as *V. glabra* Savi.

***Vigna sesquipedalis* (L.) Fruwirth, Anbau Huelsenfr. 254. 1898. *Dolichos sesquipedalis* L. Sp. Pl. ed. 2. 1019. 1763. *Frijol de rienda*. Yard-long bean; *Asparagus bean*.**

Native of southern Asia, widely cultivated for its seeds and green pods; planted occasionally in the lowlands of Guatemala, at 1,000 meters or less, and sometimes found naturalized in hedges, as in Jutiapa and San Marcos.

A coarse vine with stout glabrous stems, climbing over shrubs; stipules striate, green, conspicuously produced at the base; leaves large, the leaflets rhombic-ovate, 7-13 cm. long, obtuse or acute, 3-nerved, glabrous or nearly so; peduncles long but usually shorter than the leaves, few-flowered at the apex; legumes little compressed, about 1 cm. broad, pendent; seeds in Guatemalan plants dark brown or dark red.

This is said to be a good forage plant for stock, and the green pods may be cooked and eaten like those of *Phaseolus vulgaris*, being more tender and brittle at first than those of the related cowpea. It is little grown, however, since it is said not to be very productive. When growing, the plant reminds one of the common climbing beans, but it attracts attention because of the long pendent pods, much longer than those of any common cultivated beans.

***Vigna unguiculata* (L.) Walp. Repert. Bot. 1: 779. 1842. *Dolichos unguiculatus* L. Sp. Pl. 725. 1753. *D. Catjang* L. Mant. Pl. 259. 1767. *Vigna Catjang* Walp. Linnaea 13: 533. 1839. *D. sinensis* L. Cent. Pl. 2: 28. 1756. *V. sinensis* Endl. ex Hassk. Pl. Jav. Rar. 386. 1848. *Caupi* or *Cáupi*. Cowpea.**

Native of tropical Asia, widely cultivated in tropical and warm regions; planted only occasionally in Guatemala.

Plants coarse, erect or scandent, glabrous or nearly so; stipules lanceolate, 1.5 cm. long or less, produced at the base; leaflets ovate to lanceolate, 4-15 cm. long, obtuse or acute; inflorescence long-pedunculate, 15-25 cm. long, with 2-6 flowers at the apex, the pedicels very short, the bracts and bractlets small; calyx campanulate, 6-8 mm. long, glabrous, 4-dentate; standard 1.5-2 cm. long; legume linear, only slightly compressed, glabrous, usually 10-30 cm. long and 1 cm. broad; seeds variable in color, in the commonest form buff or clay-colored with a dark eye.

Sometimes called "frijol de maíz" in Salvador. The cowpea is an important forage and food crop in the southeastern United States, being planted over vast acreages, sometimes as a green manure crop. The leaves and pods furnish good forage for stock of all kinds. The seeds, known in the southern states as black-eyed peas or merely peas, are a popular food, either green (shelled from the pod) or dry. In the South the cowpea has the great advantage of withstanding the hot and wet weather that destroys many garden crops. In Guatemala, the cowpea has been planted only experimentally. One would think that the seeds, so much like ordinary beans although of very different and peculiar flavor, would appeal to the country people as a variation from their ordinary monotonous diet, but it is said that they dislike the flavor. The dry peas imported from the United States are sometimes seen upon the table in the banana regions.

Vigna vexillata (L.) A. Rich. in Sagra, Hist. Cub. 10: 191. 1845.
Phaseolus vexillatus L. Sp. Pl. 724. 1753. *Chorreeque*.

Moist or wet thickets, sometimes in wet pine forest, 1,500 meters or less; Alta Verapaz; Zacapa; Chiquimula; Jutiapa; Santa Rosa. Southern Mexico; British Honduras to Panama; West Indies; South America.

Stems twining, herbaceous, usually densely hirsute with brownish hairs; stipules lanceolate, 8 mm. long or less; leaflets lanceolate to ovate, 5-12 cm. long, acuminate to obtuse, rounded or truncate at the base, sparsely or rather densely pilose; inflorescences 10-30 cm. long, with 2-5 flowers at the apex of the slender peduncle, the bracts and bractlets small, deciduous, the pedicels 1-2 mm. long; calyx campanulate, 1 cm. long, pilose, 5-lobate, the lobes acuminate, about equaling the tube; petals yellow or purple, or yellow striped or spotted with purple, the standard 2-2.5 cm. long; keel incurved, obtuse; legume linear, 7-10 cm. long, 5 mm. broad, densely pilose; seeds oblong, black or brown, lustrous, 4-5 mm. long, 3 mm. broad, the hilum oblong, white.

Called "choncho" in Salvador.

ZORNIA Gmelin

Mostly low, annual or perennial herbs; leaves digitately 2- or 4-foliate, without stipels, the leaflets entire, usually pellucid-punctate; stipules subfoliaceous, often punctate; flowers solitary or in interrupted spikes, the peduncles terminal and axillary; bracts geminate, lateral, enclosing the sessile flower, resembling the stipules but larger and broader; bractlets none; calyx usually subhyaline and ciliate, the 2 upper lobes connate, the 2 lateral ones much smaller, the lowest oblong or lanceolate, equaling the upper lip; standard suborbicular, unguiculate; keel incurved, subrostrate; stamens monadelphous, the alternate anthers longer,

subbasifixed, the others short, versatile; ovary sessile, many-ovulate, the style filiform, the stigma small, terminal; legume compressed, the upper suture almost straight, the lower one deeply sinuate, articulate, the joints smooth or echinate, indehiscent, rounded-reniform, not strophiolate.

About 10 species, chiefly tropical, in America and Africa. Only one is known in Central America.

Zornia diphylla (L.) Pers. Syn. Pl. 2: 318. 1807. *Hedysarum diphyllum* L. Sp. Pl. 747. 1753. *Hierba de alacrán* (fide Aguilar); *Cadenilla*; *Corona de niño* (Jutiapa); *Solitario*; *Paternillo*.

Open plains or hillsides, often in pine-oak forest, or a weed in cultivated ground, chiefly in dry situations, 2,500 meters or less; Petén; Alta Verapaz; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Suchitpéquez; Retalhuleu; Quezaltenango; San Marcos; Huehuetenango; probably in all other departments except perhaps Totonicapán. Mexico; British Honduras to Salvador and Panama; West Indies; South America; Old World tropics.

Usually perennial but sometimes annual, erect or prostrate, the stems much branched, 50 cm. long or less, slender, glabrous or pilose; stipules lanceolate, acuminate, 8–20 mm. long, semisagittate; leaves slender-petiolate; leaflets 2, mostly lance-oblong but varying to elliptic or linear, mostly 1–3 cm. long, acuminate to rounded at the apex, glabrous or densely pubescent; flowers pale or bright yellow, the standard often veined with red, in elongate bracteate spikes; bracts large, green, broadly ovate to lance-oblong, 6–12 mm. long, acute or obtuse, asymmetric at the base and produced below the point of insertion, conspicuously veined, punctate, glabrous or sericeous, usually ciliate but sometimes eciliate; flowers about equaling the bracts; legume of few joints, shorter than the bracts, the joints pubescent and aculeolate, or sometimes glabrous.

Known in Salvador by the names “trencilla,” “hierba del pujo,” and “barba de burro.” It is well known in some parts of that country by the name “zornia,” as it has been used in medical practice by a physician who knew its Latin name and employed it particularly as a remedy for diarrhea. The plant is a highly variable one, and Benth in *Flora Brasiliensis* recognized no fewer than 14 varieties, several of which apply to Guatemalan material. Probably the best characters for separating the various forms are found in the bracts, but it is questionable whether for the present, at least, any useful purpose is served by giving names to the numerous variations. Both the bracts and leaves exhibit great variation in size, shape, and pubescence. The plant is common through most of Central America, at low and middle or even rather high elevations, and in Guatemala

it is abundant in many regions, especially in overgrazed pasture land. It often is used in household medicine in Guatemala and the other Central American countries.

GERANIACEAE. Geranium Family

References: Lenda T. Hanks and John K. Small, Geraniaceae, N. Amer. Fl. 25: 3-24. 1907. R. Knuth, Geraniaceae, Pflanzenreich IV. 129. 1912.

Annual or perennial herbs, rarely shrubs, often much branched; leaves generally opposite, with stipules, dentate or variously cleft or divided; flowers regular, cymose, small or large and showy; sepals 5, imbricate, persistent, often subulate-tipped; petals 5, deciduous, variously colored; receptacle sometimes bearing 5 glands; stamens 10, rarely 5 or fewer, the filaments united at the base; ovary 5-carpellate, the styles adnate to an elongate central column, separating from it at maturity, each carpel 2-ovulate, but only one seed maturing; endosperm scant; cotyledons folded, incumbent.

Eleven genera, best represented in temperate and warm-temperate regions; in the tropics usually confined to the mountains. Only the following genera are represented in North America.

Corolla somewhat irregular; calyx calcarate at the base, the spur adnate to the pedicel; cultivated plants; leaves palmate-nerved. *Pelargonium*.

Corolla regular; calyx not calcarate; native plants or introduced weeds.

Styles in age spirally coiled, pubescent on the inner side; anthers 5; leaves pinnately divided. *Erodium*.

Styles in age merely recoiled, glabrous on the inner side; anthers usually 10; leaves palmately lobed or divided. *Geranium*.

ERODIUM L'Héritier

Annual or perennial herbs, at first acaulescent and with a rosette of leaves, the stems in age elongate and branched; leaves opposite, pinnately divided in Guatemalan species; sepals awn-tipped and sometimes setose-appendaged at the apex; stamens 5, alternating with 5 staminodia; style column elongate, the styles pubescent within, spirally coiled when separated from the central axis; carpel bodies narrow, acute at the base; seeds smooth.

Sixty species, mostly natives of the Old World, several of them widely established as weeds in America. Two or three are native in western and southwestern United States and northern Mexico. Only the following are known in Central America.

Tips of the sepals setiferous; leaflets deeply pinnatisect; pubescence of the inflorescence not viscid. *E. cicutarium*.

Tips of the sepals not setiferous; leaflets serrate or remotely incised; pubescence of the inflorescence viscid. *E. moschatum*.

Erodium cicutarium (L.) L'Hér. ex Ait. Hort. Kew. 2: 414. 1789. *Geranium cicutarium* L. Sp. Pl. 680. 1753. *Alfilerete*; *Alfilerillo*; *Pelo de grillo*; *Alfiler*, *Alfiletero* (fide Aguilar).

Open banks or fields, stony hillsides or along roadsides, frequently on adobe walls, often a weed in cultivated ground, 1,500–3,760 meters; Chimaltenango; Quiché; Huehuetenango; Quezaltenango; reported also from Sololá and Totonicapán. Native of Europe, widely naturalized as a weed in North America; Mexico.

Plants annual or perennial, at first acaulescent, the stems usually elongate and branched in age, sparsely or densely hispidulous throughout, the pubescence scarcely if at all glandular; leaves small or rather large, pinnately divided, the segments deeply cleft into narrow segments; peduncles and pedicels hispidulous, the flowers umbellate; sepals 6–7 mm. long, with bristle-like tips; petals rose-purple, somewhat longer than the sepals; anther-bearing filaments not dentate; style column 3–4 cm. long, strigose.

This is a common weed on the hills and plains about Quezaltenango. It is seen frequently on the sides or tops of adobe walls around Quezaltenango and Tecpán. It is eaten by stock, else it would probably be much more common than it is at present in Guatemala. It is well established on the very summit of the Volcán de Santa María, where it grows just in front of the large stone cross erected there. It seemed so much out of place here, where all the other plants are native alpine, that the senior author hesitated to touch the plants before the cross in the presence of the Indian guide, this spot being one of the most important religious shrines of the Quezaltenango Indians, and one to which weird and cruel rites have been ascribed. However, when questioned, the guide stated that the plants were of no importance, and so they are probably of casual introduction by some of the many Indians who more or less regularly meet there for purposes known only to themselves.

Erodium moschatum (Burm. f.) L'Hér. ex Ait. Hort. Kew. 2: 414. 1789. *Geranium moschatum* Burm. f. Sp. Geran. 29. 1759.

Roadside meadow, about 1,950 meters; Huehuetenango (west of Aguacatán, on the road to Huehuetenango, *John R. Johnston* 1770; *Standley* 81302; both collections from the same place). Native of Europe, established as a weed in western United States and north-western Mexico.

Annual or perennial, the stems often much branched and forming almost prostrate mats, rather densely viscid-villous throughout; basal leaves mostly 10–20 cm. long, pinnately divided, the segments ovate or oval, serrate or often sparsely incised; peduncles usually longer than the leaves; sepals 6–7 mm. long, with short

subulate tips but not setiferous; petals rose-purple, longer than the sepals; style column 3-4 cm. long, strigose, the bodies of the carpels 4-5 mm. long.

GERANIUM L.

Reference: H. Emery Moore, Jr., A revision of the genus *Geranium* in Mexico and Central America, Contr. Gray Herb. 146: 1-108. pls. 1-5. 1943.

Annual or perennial herbs, often with a thick caudex, dichotomously branched; leaves opposite, stipulate, often mostly radical, the blades radiately lobate, cleft, or parted; inflorescence terminal, cymose, sometimes corymbose, usually umbelliform, or the peduncles solitary at the nodes of the stem; flowers small or large, regular, 5-parted; sepals persistent, imbricate, usually awn-tipped; petals deciduous, imbricate, reticulate-veined, alternating with 5 glands; stamens 10, all antheriferous, of 2 lengths, the filaments free or short-connate at the base, the anthers versatile; ovary 5-lobate, the styles united into a column about a long carphophore; styles revolute from the base at maturity; seeds turgid, foveolate, reticulate, or rarely smooth.

About 300 species of wide distribution, chiefly in temperate regions, in the tropics nearly or quite confined to the mountains. One other species is known from Central America (Costa Rica).

Plants usually acaulescent, at least some of the peduncles arising from the caudex; leaves densely covered beneath with appressed, silvery white hairs.

G. alpicola.

Plants with elongate stems, the peduncles solitary at the nodes or in cymose or corymbose inflorescences; leaves not white beneath.

Pedicels and sepals pilose with eglandular hairs. *G. andicola.*

Pedicels and sepals pilose with gland-tipped hairs.

Mature style beak 3 mm. long. *G. repens.*

Mature style beak 1-2 mm. long. *G. guatemalense.*

***Geranium alpicola* Loes. Bull. Herb. Boiss. II. 3: 92. 1903.**
Violeta (San Marcos).

Moist alpine meadows or open rocky slopes, 3,000-4,000 meters; Totonicapán (region of Desconsuelo; type *C. & E. Seler* 2377, probably from this region); Huehuetenango; Quezaltenango; San Marcos. Oaxaca.

Perennial from a thick woody root, usually acaulescent but sometimes developing stems as much as 20 cm. long; petioles antrorse-strigillose; leaf blades 1.5-3 cm. wide, reniform in outline, green and strigillose above, silvery white beneath and densely covered with appressed hairs, divided to the base into 5-7 subequal lobes, these deeply cleft, the ultimate lobes broadly linear; peduncles 4-8 cm. long, antrorse-strigose, 1-2-flowered, all or most of them arising from the caudex; pedicels 1-4.5 cm. long, densely strigose, without gland-tipped hairs; sepals 8-9 mm. long, densely sericeous, awned; petals 12-15 mm. long, blue or deep purple; fruit

2-2.5 cm. long, the style beak 4 mm. long, the style column antrorse-sericeous, the carpel body pilose.

One of the characteristic alpine plants of the high meadows and summits of western Guatemala.

Geranium andicola Loes. Bull. Herb. Boiss. II. 3: 93. 1903. *G. andicola* var. vel forma *longipedicellatum* Loes. loc. cit. (type collected between Todos Santos and Chiantla, Huehuetenango, C. & E. Seler 2755). *G. andicola* var. vel forma *brevipedicellatum* Loes. loc. cit. (type collected between Totonicapán and Los Encuentros, doubtless in the region of Desconsuelo, C. & E. Seler 2371).

Moist shaded slopes, often in highland pine forest, or in *Juniperus* forest, often on limestone, 1,800-4,200 meters; endemic; Jalapa; Sacatepéquez; Totonicapán; Huehuetenango; Quezaltenango; San Marcos.

Perennial from a long slender rhizome, spreading or ascending, the stems one or more from each root, slender, sparsely or densely strigose; petioles glabrate, short-pilose, or strigose; leaf blades 3-7 cm. wide, reniform or pentagonal in outline, pilose above with appressed or spreading hairs, short-hirsute beneath on the veins, divided almost to the base into 5 subequal, spatulate or broadly rhombic lobes, these 3-5-cleft into oblong lobes; peduncles short or elongate, the pedicels 1.5-7 cm. long, strigose and often short-pilose; outer sepals 8.5-11 mm. long, awned, pubescent on the veins with long spreading hairs; petals 13-20 mm. long, lavender or white with purple stripes; fruit 25-28 mm. long, the style beak 3.5-5 mm. long; style column antrorse-pilose.

Moore reports a collection by J. R. Johnston as from the Department of Sololá. The locality on the label is Los Encuentros, which is in Sololá, but we do not believe that the plant grows there; it was probably collected at Desconsuelo in Totonicapán. This species has been reported from Guatemala as *G. potentillaefolium* DC., and may well be the plant reported by Hemsley as *G. Schiedeianum* Schlecht.

Geranium guatemalense Knuth, Pflanzenreich IV. 129: 200. 1912 (type from San Miguel Uspantán, Quiché, Heyde & Lux 2914). *G. culminicola* H. E. Moore, Contr. Gray Herb. 146: 95. 1943 (type from summit of Volcán de Santa María, Quezaltenango, A. F. Skutch 841). *Cucuhual* (San Marcos); *Alfilerilla grande* (San Marcos).

Moist or dry, open or shaded places, in thickets or forest, often in forests of oak, pine, *Juniperus*, or *Cupressus*, occasionally a weed in waste or cultivated ground, 1,200-3,600 meters; Alta Verapaz; El Progreso; Chiquimula; Jalapa; Jutiapa; Guatemala; Sacate-

péquez; Chimaltenango; Quiché; Totonicapán; Huehuetenango; Quezaltenango; San Marcos. Salvador; Costa Rica; Panama.

Perennial, the roots slender or thick and somewhat ligneous, the stems often much branched, sometimes 1-2 meters long and more or less scandent over shrubs, usually ascending or procumbent, sparsely or densely pilose with spreading hairs; leaf blades 3-6 cm. wide, pentagonal in outline, hirsute above with spreading or appressed hairs, pilose or hirsute beneath on the veins with spreading hairs, divided to the middle or more deeply into 5 subequal, broadly rhombic segments, these lobate and dentate, the ultimate segments short, lanceolate, acute; peduncles 1-4 cm. long, 2-flowered, the pedicels 5-15 mm. long, glandular-pilose; outer sepals 5-6 mm. long, awned, glandular-pilose; petals 6-7 mm. long, pink or pale lavender; fruit 18-20 mm. long, the style beak 1.5-2 mm. long, the style column hispidulous and glandular; seeds 2-2.5 mm. long, black or dark brown, reticulate.

This usually has been confused with *G. mexicanum* HBK. of Mexico and it is presumably the species reported by Hemsley from Volcán de Fuego as *G. carolinianum* L. We are unable to find characters for separating *G. culminicola*, which differs from *G. guatemalense* in no definite characters, those used in Moore's key to species not applying to the specimens that he has determined and listed. The species in this group of the genus have been inordinately multiplied, and it is believed that a good number of those recognized in the latest monograph of the Middle American species will have to be reduced.

Geranium repens H. E. Moore, Contr. Gray Herb. 146: 78. 1943. *G. pulchrum* Morton, Phytologia 1: 147. 1935, not *G. pulchrum* N. E. Brown, 1895 (type from Santa Elena, Chimaltenango, A. F. Skutch 709).

Moist or rather dry forest, often in pine forest, 2,000-4,000 meters; El Progreso; Jalapa; Sacatepéquez; Chimaltenango; Totonicapán; Quezaltenango. Western Mexico; Costa Rica; Panama.

Perennial from a slender or thick root, the stems 30-50 cm. long, procumbent with ascending branches, densely strigillose or short-pilose or glabrate; leaf blades 2-5 cm. wide, pentagonal in outline, strigillose or pilose above, strigose or pilose beneath on the veins, divided almost to the base into 3-7 subequal, narrowly rhombic segments, the lobes cleft and dentate; peduncles 3-10 cm. long, pilose with spreading or retrorse hairs, 2-flowered, the pedicels 1-3.5 cm. long, glandular-pilose; outer sepals 6 mm. long, awned, strigillose and glandular-pilose; petals 10-14 mm. long, lilac to pale pink; fruit 18 mm. long, the style beak 3 mm. long, the style column hispidulous and glandular; seeds 2-3 mm. long, dark brown, rather coarsely reticulate.

PELARGONIUM L'Héritier. Geranium

Mostly perennial herbs, often somewhat shrubby, frequently with fragrant foliage, the stems usually thick; leaves opposite or alternate, entire, dentate, lobate,

or parted, usually palmate-nerved; flowers in umbelliform cymes, generally large and showy; sepals unequal, one of them produced into a short spur, this adnate to the pedicel; petals unequal, the 2 upper ones larger than the 3 lower ones; stamens 10, only 7 with anthers, or rarely only 2-6 with anthers; style column rostrate, the styles pubescent inside, spirally coiled when free from the axis; carpel bodies narrow, acute at the base; seeds foveolate or smooth.

About 230 species, practically all native in South Africa. A few species have long been popular in cultivation and are grown in probably all civilized parts of the earth.

Pelargonium hortorum L. H. Bailey, Stand. Cyclop. Hort. 2531. 1916. *Geranio*. *Common geranium*.

The common geranium of gardens, grown for ornament in almost all parts of the earth, is of uncertain ancestry, probably the result of hybridization between various wild species. It is sometimes called *P. zonale* (L.) L'Hér. or *P. inquinans* (L.) L'Hér., but the name here used is probably a more practical one.

Geraniums are grown in almost every Guatemalan garden, either in pots or more often in the open ground, where the plants continue to grow for many years, often reaching a height of 2 meters or even more and becoming decidedly woody. In many places they have become more or less naturalized, particularly in hedges and especially in the western departments. They seem to thrive in most places, even when they receive little or no attention. The common red geranium with single flowers is the one most often seen, but there are innumerable other varieties, differing in the color of the flowers and in the color and shape of the leaf. Some years ago thousands of geraniums were planted by the Jefe Político of San Marcos along the Carretera Internacional. The plants have not thrived, although many still remain, and in the neighboring dooryards there are thousands of plants that receive little attention and make a better showing.

In Guatemala, geranium leaves are applied as poultices to sores and ulcers, which they are said to heal quickly.

Several other species of *Pelargonium* are grown in Guatemala for ornament. A common plant is the rose geranium, *P. graveolens* (Thunb.) L'Hér., with deeply lobed and crisped, rough, very fragrant leaves. It is not a favorite in the United States, principally, perhaps, because it seldom blooms, but where it is grown, a leaf is sometimes added to jelly to flavor it. Planted out of doors in Guatemala, the rose geranium often becomes a meter high or taller.

The type of *Pelargonium* called by Bailey *P. domesticum*, and sometimes grown as a pot plant in the United States under the name pelargonium or Lady Washington geranium, is seen occasionally in Guatemala as a pot plant, but it is rather rare and a shy bloomer. More common perhaps is the ivy-leaved geranium, *P. peltatum* (L.) Ait., with somewhat scandent stems and peltate, very fleshy, shallowly 5-lobate leaves. It used to be fairly common as a pot plant in the United States, but rarely is seen now.

OXALIDACEAE

References: J. K. Small, Oxalidaceae, N. Amer. Fl. 25: 25-58. 1907; R. Knuth, Oxalidaceae, Pflanzenreich IV. 130. 1930.

Herbs with slender, horizontal or bulb-like rootstocks, or sometimes shrubs or trees; leaves alternate, often all basal, compound, palmately or pinnately 3-foliate or often several-many-foliate, the leaflets entire, mostly obcordate or obreniform; stipules present, free or adnate to the petiole, sometimes none; flowers perfect, nearly regular but asymmetric, in simple or compound cymes or umbels terminating peduncles; sepals 5, herbaceous or rarely petaloid; petals 5, variously colored; stamens twice as many as the sepals, in 2 rows; filaments united at the base, the longer ones often appendaged dorsally; anthers 2-celled, versatile; gynoecium 5-carpellate, the carpel bodies united, the styles distinct or merely coherent; stigmas terminal or introrse, entire or cleft; ovules several-many in each carpel, rarely only 1-2; fruit capsular, each carpel dehiscent by a longitudinal valve, or baccate; seeds transversely rugose, the testa crustaceous; endosperm carnose; embryo straight.

Seven genera, the species widely dispersed in both hemispheres. Only the following are found in North America.

Fruit baccate; trees *Averrhoa*.

Fruit capsular; herbs or small shrubs.

Leaves pinnate, with very numerous small leaflets; carpels of the fruit free in age.
Biophytum.

Leaves palmately or pinnately 3-foliate, or the leaflets rarely more numerous but not pinnately arranged; carpels of the fruit united throughout . . *Oxalis*.

AVERRHOA L.

Trees; leaves alternate, odd-pinnate; flowers regular, small, cymose-paniculate; sepals imbricate; petals 5, hypogynous, contorted; stamens 10, all antheriferous or 5 of them reduced to staminodia, short-coalescent at the base; ovary 5-lobate, 5-celled, the 5 styles free, the stigmas terminal, capitate; ovules numerous in each cell; fruit baccate, oblong, indehiscent; seeds naked or arillate; endosperm minute.

Two species, native in the Old World tropics.

Averrhoa Carambola L. Sp. Pl. 428. 1753.

Native probably of southeastern Asia, but cultivated extensively in other tropical regions; rarely planted in the lowlands of Guatemala and doubtless also about Guatemala, and in other regions of Central America, but nowhere common.

A tree of 5-9 meters, sparsely branched, the bark dark brown; leaves large, pinnate, with 5-7 pairs of leaflets, petiolate; leaflets short-petiolulate, obliquely ovate or oblong-ovate, abruptly short-acuminate, obliquely cuneate at the base, membranaceous, paler beneath, glabrous or puberulent beneath on the costa; panicles about 4 cm. long, the branches viscid-pubescent; sepals ovate, obtuse, 2.5 mm. long; petals lance-oblong, obtuse, rose-purple, as much as 8.5 mm. long; stamens shorter than the sepals, minutely puberulent; fruit of the size of a hen's egg or larger, ovoid, acutely 5-angulate, yellow, fragrant, with very acid pulp.

Called "carambola" in Salvador. The fruit is edible, being used in some regions to prepare pickles and preserves, but it is too sour to find favor in Central America, and the tree is grown only as a curiosity. *A. Bilimbi* L., in which the leaves have 10-20 pairs of leaflets, probably is in cultivation in Guatemala and it was, in fact, reported by Hemsley on the basis of a Friedrichsthal collection. It is called "mimbro" in Salvador, where the fruit is utilized for making *refrescos* and the juice for removing stains from cloth.

BIOPHYTUM De Candolle

Caulescent herbs, or the stems often somewhat ligneous; leaves pinnate, clustered at the apex of the stem or in lateral clusters, the leaflets numerous, mostly oblong; terminal leaflet represented by a setiform appendage at the end of the rachis; peduncles axillary or terminal, the flowers usually numerous, umbellate or capitate, yellow, regular; sepals imbricate; petals hypogynous, contorted; stamens 10, all antheriferous, 2-seriate, the filaments united at the base; ovary 5-lobate, 5-celled, the 5 styles distinct; stigmas terminal, capitate; capsule loculicidally dehiscent, the cells finally separating from the axis and connate with it only at the base.

About 50 species, in the tropics of America, Africa, and Asia. Only one species is found in North America.

Biophytum dendroides (HBK.) DC. Prodr. 1: 690. 1824.
Oxalis dendroides HBK. Nov. Gen. & Sp. 5: 250. 1822.

Moist to rather dry, shaded slopes, often in open pine forest, sometimes on shale, 1,300 meters or less; Alta Verapaz; Izabal; Huehuetenango; San Marcos. Southern Mexico; British Honduras; Honduras; Nicaragua; western South America.

Plants probably perennial, erect or ascending, resembling a diminutive tree, the stems mostly simple, stiff and rather wiry, 5-25 cm. high, retrorse-pilose;

leaves very numerous, densely crowded at the apex of the stem, 3–12 cm. long, the rachis pubescent; leaflets usually 20–40, oblong to obliquely obovate, mostly 1 cm. long or shorter, obtuse and apiculate, ciliate, sparsely pilose beneath; peduncles slender, 5 cm. long or shorter, the cymes small, few-flowered, congested; sepals 6–8 mm. long, acuminate, the outer ones linear or linear-lanceolate, the inner narrowly linear; petals lilac or pink striped with purple, twice as long as the sepals; capsule oblong, 4–5 mm. long, pubescent at least about the apex.

The leaves are said to be sensitive, like those of *Mimosa*, the leaflets folding together when the leaves are touched.

OXALIS L.

Herbs or rarely suffrutescent plants, perennial or annual, acaulescent or with elongate, erect or repent stems, the roots usually rhizomatose or bulbous; leaves often all basal, when cauline alternate, with or without stipules, digitately 3–many-foliolate or pinnately 3-foliolate, the leaflets entire or obcordate-bilobate; peduncles axillary, basal, or terminating the stems, cymosely or umbellately 1–10-flowered, the flowers small or medium-sized, yellow, pink, or purple, rarely white, regular; sepals imbricate; petals hypogynous, contorted; stamens 10, all antheriferous, the filaments more or less connate at the base, 2-seriate, the 5 shorter ones exterior and opposite the sepals, the 5 longer ones interior, opposite the petals; ovary 5-lobate, 5-celled, the 5 styles distinct; stigmas terminal, capitate; ovules 1–many in each cell; fruit capsular, loculicidally dehiscent, the valves persistent upon the axis; tegument of the seeds carnose, arilliform, the testa crustaceous; endosperm carnose, the embryo straight.

Species about 800, according to Knuth, in tropical and temperate regions of both hemispheres, most numerous in Africa and South America. Two or three other Central American species are known, in Costa Rica and Panama.

Plants acaulescent; petals usually purple or pink; rootstock bulb-like, covered with numerous imbricate scales.

Leaflets 4.

Longer filaments appendaged; leaflets usually lobate to the middle or more deeply, the lobes oblong or narrowly oblong, obtuse *O. Hayi*.

Longer filaments not appendaged; leaflets lobed less than halfway to the base, the lobes very broad and rounded *O. divergens*.

Leaflets 3.

Leaflets lobate more than halfway to the base, the lobes narrowly lance-oblong *O. minarum*.

Leaflets lobate much less than halfway to the base, the lobes broad.

Leaflets broader than long, large, mostly 3–5 cm. long *O. dimidiata*.

Leaflets not broader than long or, if so, much smaller.

Filaments appendaged dorsally; leaflets mostly 2–3.5 cm. wide.

O. latifolia.

Filaments not appendaged; leaflets mostly 1.5 cm. wide or smaller.

Inflorescences with several to numerous, usually more than 3, flowers.

O. Pringlei.

Inflorescences 1-3-flowered.

Flowers about 7 mm. long; inflorescences not or scarcely exceeding the leaves..... *O. calcicola*.

Flowers 12-18 mm. long; inflorescences much exceeding the leaves.
O. alpina.

Plants with elongate stems; petals yellow; rootstock very slender or none.

Leaves palmately 3-foliolate; pedicels not articulate; capsule erect; stigmas capitate.

Leaflets acute or acuminate; plants erect, suffrutescent..... *O. rhombifolia*.

Leaflets rounded or deeply emarginate at the apex.

Stems elongate, usually suffrutescent, erect or ascending, sometimes reclining on other plants; leaflets rounded or retuse at the apex.

O. clematodes.

Stems mostly short and very slender, often prostrate and rooting, sometimes erect, herbaceous; leaflets deeply lobate or emarginate at the apex.

Plants arising from a thick vertical taproot, or the rhizome sometimes bearing small tuberous roots at the internodes..... *O. albicans*.

Plants with very slender rhizomes, the taproot very slender, the stems never bearing tuberous roots at the internodes..... *O. corniculata*.

Leaves pinnately 3-foliolate (rachis conspicuously prolonged beyond the lateral leaflets); pedicels articulate; capsule nutant; stigmas 2-cleft.

Capsule abundantly short-pilose, often on the sides as well as on the angles; stems usually densely incurved-pilosulous..... *O. Neaei*.

Capsule glabrous or with a few short hairs on the angles.

Stems glabrous..... *O. stenomerus*.

Stems usually densely pubescent with short, subappressed or incurved hairs..... *O. yucatanensis*.

***Oxalis albicans* HBK. Nov. Gen. & Sp. 5: 189. 1821. *O. Wrightii* Gray, Pl. Wright. 1: 27. 1852. *Sacachiquim* (Quezaltenango).**

Open banks and fields, often along roadsides or in dry rocky places, frequently growing in very hard, closely packed soil, sometimes a weed in cultivated ground, 1,500-3,900 meters; Sacatepéquez; Huehuetenango; Totonicapán; Quezaltenango; San Marcos. South-western United States; Mexico; reported from Ecuador, the report to be regarded with suspicion.

Plants perennial from a thick deep taproot, the stems numerous, short or elongate, slender, usually prostrate and rooting at the nodes, often much branched and forming dense mats, densely leafy, generally densely pilose with ascending or spreading hairs; leaves small, palmately 3-foliolate, the leaflets broadly or very broadly obcordate, mostly 8 mm. long or less, sparsely or rather densely pilose on both surfaces, broadly cuneate at the base, the lobes rounded; peduncles axillary, pilose, 1-4 cm. long, usually 1-2-flowered, the slender pedicels 6-10 mm. long, hirsutulous or pubescent; sepals in age 4-5 mm. long; petals pale yellow, 8-12 mm. long; longer filaments glabrous; capsule cylindric, 16-20 mm. long, densely pubescent, gradually attenuate to the apex.

This plant is plentiful about Quezaltenango, growing persistently through the cold dry months, often in ground so hard and exposed to sun and wind that it is difficult to understand how any plant can live in such an environment. This species is very closely related to *O. corniculata* L., and we know of no sure means of separating them. Much labor has been spent in study of the yellow-flowered *Oxalis* species that have been isolated as a distinct genus, *Xanthoxalis*, by some authors, and many segregates from the group have been published, but the results have been unsatisfactory, since no two students agree as to how the material shall be divided.

We have in general followed the nomenclature of Knuth in this and other groups of the genus, but his treatment of the group is quite as unsatisfactory as that of other authors, although scarcely worse, except that he has recognized a greater number of species. As a matter of fact, all the so-called species of the *Xanthoxalis* group occurring in Mexico and Central America could be referred quite satisfactorily to a single species. These remarks apply equally well to those species that have been separated as the genera *Lotoxalis* and *Ionoxalis*, in both of which species have been multiplied fantastically. Small was able to key in a fashion all the species of these various groups that he recognized from North America, but Knuth keyed as many of the species as he could in some of his groups, and then gave up in despair and merely listed them by number in his keys. If species can not be keyed, it is safe to assume they have no claim to specific rank. In all groups of the genus much use has been made of the presence or absence of appendages on the stamens. After investigation of this character in Central American material of *Oxalis*, we are inclined to doubt that the describers of the species and the several monographers of the genus ever investigated or saw the appendages in most of the plants that they claim possess them. Furthermore, if two plants otherwise exactly alike can not be separated except by the appendage character, we are suspicious of its value or even, at times, of its existence.

Oxalis alpina Rose ex Knuth, Notizbl. Bot. Gart. Berlin 7: 315. 1919. *Ionoxalis alpina* Rose, Contr. U. S. Nat. Herb. 10: 110. 1906.

Alpine meadows, about 3,700 meters; Sacatepéquez (crater of Volcán de Agua); Quezaltenango (summit of Volcán de Santa María). Mountains of southern Mexico.

Plants acaulescent, arising from a fibrous-coated bulb 8-9 mm. thick; leaves basal, few, on long slender petioles, palmately 3-foliate; leaflets glabrous, obreni-

form-deltoid, 2 cm. long and broad or usually much smaller, somewhat paler beneath, excised at the apex, the lobes rounded; peduncles slender, glabrous, 20 cm. long or less, the pedicels mostly 2-3, as much as 4 cm. long but usually shorter, glabrous; sepals lanceolate, 4.5-5 mm. long, glabrous, bearing at the apex 2 reddish glands; petals white or pale pink, 18-20 mm. long, cuneate-obovate; filaments pubescent, not appendaged.

Oxalis calcicola Standl. & Steyermark. Field Mus. Bot. 23: 118. 1944.

Known only from the type, Sierra de los Cuchumatanes, Huehuetenango, vicinity of Chémal, 3,700 meters, rocky limestone outcrops about trees of *Juniperus Standleyi*, *Steyermark* 50258.

Acaulescent, the whole plant 5 cm. high or less (including the roots), the bulb 1.5-2 cm. long, 1 cm. thick, ovoid, dark brown, the scales 3-nerved; leaves basal, very numerous, palmately 3-foliolate, the filiform petioles 1-2 cm. long, glabrous; leaflets obreniform-cordate, mostly 4-5 mm. wide, shallowly excised at the apex, very broadly cuneate at the base, the lobes broadly rounded, glabrous; peduncles basal, shorter than the leaves, 1-2-flowered, minutely puberulent or glabrous, the pedicels about 4 mm. long; sepals oblong-lanceolate, 3.5 mm. long, acute, pale green, with 2 united reddish appendages at the apex; petals rose-purple, 7 mm. long, broadly cuneate-obovate; filaments naked or very minutely appendaged, the longer ones sparsely and minutely pilosulous.

Oxalis clematodes Donn. Smith, Bot. Gaz. 18: 198. 1893.
Xanthoxalis clematodes Small, N. Amer. Fl. 25: 56. 1907.

Wet thickets or forest, 1,300-2,500 meters; endemic; Jalapa; Suchitepéquez; Sololá; Quiché (type from San Miguel Uspantán, *Heyde & Lux* 2992); Huehuetenango.

Plants suffrutescent, erect or reclining, the stems stiff or slender and weak, reddish, densely pilose with short, spreading or ascending hairs or finally glabrate, usually much branched; leaves on long slender petioles, often with clusters of small leaves in their axils, palmately 3-foliolate; leaflets obovate to orbicular-obovate or broader, mostly 1.5-3 cm. long, rounded to rather deeply emarginate at the apex, broadly cuneate at the base, thin, when young thinly pilose with long slender hairs; peduncles axillary, erect, hirsute, 1-4-flowered, the pedicels 2-8 mm. long; sepals 4.5-5 mm. long; petals yellow, 10-14 mm. long; filaments all pubescent; capsule cylindric-conic, 6-7 mm. long, acute, densely strigillose, longer than the sepals; ovary cells 1-2-ovulate.

Oxalis corniculata L. Sp. Pl. 435. 1753. *O. herpestica* Schlecht. Linnaea 27: 525. 1854 (described from plants growing in Europe in soil taken from roots of orchids imported from Guatemala). *Chichafuerte*; *Platanito*; *Cac* (Cobán, Quecchí); *Cucuyulo*; *Cucuyol*, *Chamichá* (fide Aguilar).

Moist to wet fields, thickets, or banks, sometimes on cliffs or a weed in waste or cultivated ground, especially in *cafetales*, 300-2,700

meters; Alta Verapaz; Izabal; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Retalhuleu; Chimaltenango; Quiché; Huehuetenango; Quezaltenango; San Marcos. United States; Mexico; Central America; South America; widely distributed in the Old World; in America perhaps wholly or in part introduced, but appearing quite as much at home as most of the native species.

Plants perennial from a slender, simple or much branched root, the stems usually numerous, slender, branched, prostrate and rooting or sometimes erect, mostly 30 cm. long or less, very leafy; leaves long-petiolate, palmately 3-foliate, broadly cuneate-obcordate, mostly 1 cm. long and wide or smaller, incised at the apex for about one-third their length, pilose with long hairs especially beneath and along the margins; peduncles axillary, 1-7 cm. long, sparsely pilose, 1-6-flowered, the slender pedicels about 1 cm. long, hirsutulous-puberulent or glabrate; sepals lanceolate or ovate-lanceolate, acute, 5 mm. long, not callous at the apex; corolla 8-10 mm. long, pale yellow or yellowish white, the petals cuneate, rounded and retuse at the apex; capsule 12-15 mm. long, appressed-pilosulous.

Some of the Guatemalan and other Central American material has been referred to *O. stricta* L., a closely related and very similar species that is rather doubtfully distinct. *Oxalis corniculata* is a very common weed in the mountains of Guatemala, often occurring in great abundance in old grain fields or in dry meadows or pastures. There are often found together two clearly distinct color forms, one with the more usual, pale but rather bright yellow petals, the other with creamy white ones. Careful comparison by Dr. J. R. Johnston and the senior author did not reveal any other differences between these plants, both of which were plentiful in the plantations at the Escuela Nacional de Agricultura, Finca La Alameda near Chimaltenango. The plant is well known in Guatemala by the name "chicha-fuerte," which is said to be given because of the acid flavor of the foliage that suggests the taste of strong chicha. Schoolboys use the crushed plant to remove ink stains from their fingers. The juice is also used for treating sores in the mouth. The vernacular name "platanito" sometimes given to this and other species refers to the small seed pods, whose shape suggests a plantain or banana.

Oxalis dimidiata Donn. Smith, Bot. Gaz. 15: 27. 1890. *Ionoxalis dimidiata* Small, N. Amer. Fl. 25: 43. 1907.

Known only from the vicinity of Cobán, Alta Verapaz, open banks or mossy banks in forest, sometimes on limestone, 1,300-1,400 meters, the type being *Tuerckheim* 1682.

Plants 10-18 cm. high, acaulescent, the bulb very fibrous, brown, 7-12 mm. broad; leaves basal, several, glabrous, palmately 3-foliate; leaflets often purplish

beneath, rather succulent, 2-4.5 cm. broad, almost lunulate in outline, with a very broad and shallow apical sinus, the spreading lobes very obtuse or rounded at the apex; peduncles basal, glabrous, 7-20 cm. long, with 3-5 or often more numerous flowers, the pedicels 1-2 cm. long, glabrous; sepals lanceolate or oblong-lanceolate, 3-4 mm. long, glabrous, reddish-bicallous at the apex; petals pale purple, 11-13 mm. long, oblong-spatulate; longer filaments pubescent, not appendaged, the shorter ones glabrous.

Oxalis divergens Benth. Pl. Hartweg. 9. 1839. *O. cobanensis* Knuth, Notizbl. Bot. Gart. Berlin 7: 315. 1919 (type from Oliva near Cobán, Alta Verapaz, *Tuerckheim* 11).

Moist or wet fields or thickets, sometimes in pine-oak forest, or a weed in cultivated ground, 900-2,100 meters; Alta Verapaz; reported from Guatemala; Sacatepéquez; Chimaltenango; Quiché. Mexico; Honduras.

Plants 15-25 cm. high, acaulescent; bulbs 1-2 cm. broad, brown, the scales 3-nerved; leaves basal, several, on long slender petioles, palmately 4-foliolate or some of the leaves 3-foliolate; leaflets glabrous or nearly so, rather thick and succulent, obdeltoid, mostly 3-5 cm. wide, rather shallowly excised at the apex, the lobes broad, rounded at the apex; peduncles basal, somewhat longer than the leaves, bearing a simple umbel of 6-10 flowers, the pedicels 10-17 mm. long, slender, glabrous; sepals lanceolate or linear-lanceolate, 4.5-5.5 mm. long, glabrous, reddish-bicallous at the apex; petals violaceous, 12-15 mm. long; filaments minutely pubescent, not appendaged; styles sparsely pubescent; capsule broadly oblong, 5-6.5 mm. long.

The plant is common about Cobán in pastures, thickets, and elsewhere, and often is a rank weed in gardens. Its leaves, like those of many other species, have a strong and agreeable acid flavor.

Oxalis Hayi Knuth, Notizbl. Bot. Gart. Berlin 7: 316. 1919. *Ionoxalis divaricata* Small, N. Amer. Fl. 25: 33. 1907, not *O. divaricata* Mart. & Zucc., 1823-24. *Loch* (Huehuetenango).

Moist fields or open rocky slopes, sometimes a weed in corn fields, 1,900-2,800 meters; Chimaltenango; Sololá; Huehuetenango. Mountains of southern Mexico.

Plants acaulescent, 10-25 cm. high, the bulbs reddish brown, 12-20 mm. broad, the scales multinerved; leaves basal, palmately 4-foliolate; leaflets 2-5 cm. long and wide, cuneate-deltoid in outline, deeply lobate, often almost to the base, the lobes narrowly lance-oblong, acute or obtuse, glabrous or nearly so; peduncles basal, glabrous, bearing an umbel of 3-11 flowers, the pedicels 1-3 cm. long, glabrous; sepals lanceolate or oblong-lanceolate, 4.5-5 mm. long, glabrous, reddish-bicallous at the apex; petals violaceous, 12-16 mm. long; shorter filaments glabrous, the longer ones pubescent above, appendaged below the middle.

The bulbs are said to be eaten raw, and the leaves after being cooked. Those of all species of the group *Ionoxalis* are edible raw.

Oxalis latifolia HBK. Nov. Gen. & Sp. 5: 237. *pl.* 467. 1822. *Hierba de pollo* (Zacapa); *Camotillo de azúcar* (Huehuetenango).

Moist or rather dry meadows or open hillsides, sometimes on shaded slopes or a weed in grain fields or *cafetales*, 1,500–3,000 meters; Zacapa; Jalapa; Guatemala; Sololá; Huehuetenango; Quezaltenango; reported from Sacatepéquez. Mexico; Honduras; Costa Rica; Panama; West Indies; western South America.

Plants 15–20 cm. high, acaulescent; bulbs 1–1.5 cm. broad, the scales deep brown, multinerved; leaves basal, usually several, long-petiolate, palmately 3-foliate; leaflets mostly 3.5 cm. wide or smaller, shallowly or rather deeply excised at the apex, the lobes divergent, rounded, very sparsely pilose or glabrous, sometimes ciliate; peduncles basal, very sparsely pilose or glabrous, 14–20 cm. long, bearing a simple umbel of 6–13 flowers, the pedicels 1–2 cm. long, glabrous or nearly so; sepals oblong or lance-oblong, 3.5–5 mm. long, acute, glabrous, reddish-bicallous at the apex; petals violaceous, 8–13 mm. long, rarely white; longer filaments pubescent, appendaged, the shorter ones glabrous.

Known in Yucatan by the Maya names “yalel,” “elel,” “zuts-keymil,” and “zutskeyem”; “acederilla” (Yucatan). In the Sierra de las Minas, quail eat the fleshy tubers of this and other species of *Oxalis*.

Oxalis minarum Standl. & Steyerl. Field Mus. Bot. 23: 58. 1944.

Known only from the type, Zacapa, along stream in ravine, pine-covered slopes, Sierra de las Minas, along trail between Río Hondo and summit of mountain at Finca Alejandría, 1,000–1,500 meters, *Steyermark* 29718.

Plants acaulescent, the rootstock bulb-like, 1 cm. in diameter; leaves on slender weak petioles 15–22 cm. long, digitately 3-foliate; leaflets deeply 2-lobate, the lobes divergent-ascending, 2.5–5.5 cm. long, 5–12 mm. wide, gradually narrowed to the rounded or obtuse apex, glabrous; peduncles glabrous, about 30 cm. long, the 15–20 flowers simply umbellate; bracts ovate, abruptly acute, 2–2.5 mm. long, the pedicels filiform, 13–30 mm. long, glandular-pilosulous above; sepals lanceolate or oblong-lanceolate, subacute, each with 2 reddish linear-oblong apical tubercles, 4.5 mm. long, sparsely glandular-pilosulous at the base; petals 12–13 mm. long, lilac; filaments pilosulous above, the styles densely hirsutulous; capsule oblong, 10–12 mm. long; seeds numerous, reddish brown, obovoid, transversely 8–10-rugose, longitudinally 3-costate.

Oxalis Neaei DC. Prodr. 1: 690. 1824. *O. pilosissima* Turcz. Bull. Soc. Nat. Moscou 31, pt. 1: 427. 1858. *O. Berlandieri* Torr. Bot. Mex. Bound. Surv. 41. 1859. *O. guatemalensis* Knuth, Repert. Sp. Nov. 29: 214. 1931 (type from Palo Gordo, Suchitepéquez, Morton in 1928). *Vinagrillo*; *Tamarindillo*; *Violeta* (Santa Rosa).

Moist or wet thickets or thin forest, sometimes in rocky places, often on grassy hillsides or in meadows, frequently in open pine-oak forest, often a weed in cultivated or waste ground, 1,900 meters or lower, most frequent at low elevations; Petén; Alta Verapaz; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Chimaltenango; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos. Mexico; British Honduras to Salvador and Costa Rica; tropical South America.

An erect perennial, commonly 15–30 cm. high, herbaceous or rarely suffrutescent below, the stems simple or branched, solitary or several from an often woody root, usually densely tomentulose or incurved-pilosulous; leaves alternate or fasciculate, long-petiolate, pinnately 3-foliolate; leaflets lance-oblong or lanceolate to ovate, mostly 2.5 cm. long and 1 cm. wide or smaller, emarginate or rounded at the apex, obtuse at the base, thin, paler beneath, pilose or almost glabrous on the upper surface, usually densely pilose beneath; peduncles axillary, erect, 4 cm. long or shorter, the pedicels hirsutulous or puberulent, 3–5 mm. long, the umbels about 5-flowered; sepals 4–5 mm. long, lanceolate, pubescent; longer filaments appendaged below the middle, pubescent above the appendage; styles glabrous; capsule oblong or ovoid, 4–6 mm. long, sparsely or densely pubescent; seeds ellipsoid, brown, transverse-corrugate.

Known in Salvador by the names “agrillo,” “comino,” “hierba de conejo,” “jocotillo,” “nancillo,” and “tamarindillo.” The leaves are sometimes eaten there. This is one of the commonest lowland weeds of Central America, often abundant in coffee plantations. The bright-colored flowers are widely open in early morning, but close about noon. In the group of *O. Neaei* Knuth recognized about a dozen species as distinct, but he keyed them almost wholly on the basis of distribution. Since most of his species occur in Mexico, this does not make the key a very practical one for separating the “species,” all or most of which are probably reducible to one.

Oxalis Primavera (Rose) Knuth has been reported from Guatemala by Small and Knuth, no localities or collections being cited. Probably the plant so reported is the one we here call *O. Pringlei*.

Oxalis Pringlei Rose ex Knuth, Notizbl. Bot. Gart. Berlin 7: 315. 1919. *Ionoxalis Pringlei* Rose, Contr. U. S. Nat. Herb. 10: 114. 1906. *Cucuyul*.

Open or shaded slopes or open pine forest, 1,500–3,000 meters; Chiquimula; Sololá; Huehuetenango. Mountains of Mexico.

Acaulescent, 10–20 cm. high, the bulbs pale brown, 6–9 mm. thick, the scales 3-nerved; leaves basal, few or rather numerous, long-petiolate, glabrous, palmately 3-foliolate; leaflets 10–18 mm. wide, obreniform-cordate, shallowly incised at the apex and with a broad sinus, rounded, glabrous; peduncles basal, glabrous, 10–

15 cm. long, the simple umbels 3-6-flowered, the pedicels 12-22 mm. long, almost filiform, glabrous; sepals linear-lanceolate, glabrous, 3.5-4.5 mm. long, reddish-bicallous at the apex; petals rose-purple, oblong-obovate, 13-15 mm. long; longer filaments pubescent, not appendaged, the shorter ones glabrous; capsule oblong-linear, acuminate; seeds numerous in each cell.

It is probable that some older name may be found for this plant, which could receive perhaps equally well any one of several other names recognized by Knuth and Small.

***Oxalis rhombifolia* Jacq.** *Oxalis* 22. *pl.* 2. 1794. *O. acuminata* Schlecht. *Linnaea* 5: 224. 1830. *O. Lindenii* Turcz. *Bull. Soc. Nat. Moscou* 31, pt. 1: 429. 1858. *Xanthoxalis acuminata* Small, *N. Amer. Fl.* 25: 56. 1907.

Moist or wet thickets or mixed forest, 900-1,500 meters; Alta Verapaz; Santa Rosa; Suchitepéquez or Retalhuleu; Huehuetenango. Southern Mexico; Honduras; reported from Costa Rica; Colombia and Venezuela.

Plants slender, erect, suffrutescent, often a meter high, the stems branched, reddish or rufous, minutely pubescent or glabrate; leaves numerous, alternate, often congested, on long slender petioles, palmately 3-foliate; leaflets thin, rhombic-ovate to lanceolate, 5 cm. long and 2 cm. wide or smaller, acute or acuminate, paler beneath, sparsely or densely pilose on both surfaces, entire; peduncles axillary, about equaling the petioles, umbellately 2-5-flowered, the pedicels 2-8 mm. long, puberulent; sepals 4.5-5 mm. long, oblong-lanceolate, ciliate, pubescent; petals yellow, twice as long as the sepals; longer filaments pubescent; styles pubescent.

Oxalis rubrocincta Lindl. was recorded erroneously from Guatemala. According to Knuth, it is a synonym of *O. carnosa* Molina, a plant of Andean South America.

***Oxalis stenomeris* Blake**, *Contr. U. S. Nat. Herb.* 24: 8. 1922.

Open pine forest, at or little above sea level; endemic; Izabal (type collected along trail between Los Amates and Izabal, *S. F. Blake* 7791).

Plants erect, 25-35 cm. high, sparsely or much branched, herbaceous throughout or suffrutescent below, the stems ferruginous, glabrous; leaves pinnately 3-foliate, slender-petiolate, the petioles short or elongate; leaflets elliptic-ovate to lanceolate, the terminal one 2.5 cm. long and 12 mm. wide or smaller, often attenuate to the apex, the apex usually shallowly emarginate, glabrous, paler beneath; peduncles axillary, glabrous, equaling or longer than the petioles, umbellately about 7-flowered, the pedicels 3 mm. long or less; sepals oval-ovate, obtuse, 3.5-4.5 mm. long, sparsely ciliate with short-stipitate glands; petals yellow, 6 mm. long; longer filaments appendaged dorsally, pubescent above the appendage; style pubescent; capsule oval-ovoid, obtuse, ciliate on the angles.

This species is closely related to *O. Neaei*, of which it may be only an extreme variety, and even more closely to *O. yucatanensis*.

Oxalis variabilis Jacq., native of South Africa, is grown in pots and gardens in Guatemala as an ornamental plant and is well known in cultivation in the United States. It is an acaulescent bulbous plant with rather handsome, rose-purple flowers.

Oxalis yucatanensis (Rose) Riley, Kew Bull. 1923: 166. 1923.
Lotoxalis occidentalis Rose, Contr. U. S. Nat. Herb. 10: 115. 1906.
L. yucatanensis Rose, op. cit. 116. *O. yucatensis* Knuth, Notizbl. Bot. Gart. Berlin 7: 291. 1919.

Moist or wet savannas or open pine forest, 350 meters or less; Petén; Zacapa; Santa Rosa; Huehuetenango. Southern Mexico; British Honduras.

Plants erect, annual or perennial, sometimes 75 cm. high but usually lower, herbaceous or often suffrutescent below, simple or branched, the stems frequently brown or reddish, incurved-pilosulous or puberulent; leaves pinnately 3-foliate, on long or short, slender petioles; leaflets thin, mostly ovate or oblong-ovate, chiefly 1–2.5 cm. long, truncate or emarginate at the apex, glabrous to rather densely pilosulous on both surfaces; peduncles equaling or longer than the petioles, few-flowered, the pedicels densely pubescent, 2–4 mm. long; sepals 4–5 mm. long, acute or subacuminate, glabrous or sparsely pilosulous; petals yellow; longer filaments appendaged below the middle, pubescent; capsule oblong, 6–8 mm. long, glabrous or sometimes minutely ciliate on the angles.

Probably only a form or variety of *O. Neaei*, from which it can not be distinguished very definitely, the pubescence of the capsules being apparently variable in quantity, as is that of the leaves and stems. Called “yala-elel” (Maya) and “agritos” in Yucatan.

TROPAEOLACEAE. Nasturtium Family

References: Fr. Buchenau, Tropaeolaceae, Pflanzenreich IV. 131. 1902; George V. Nash, Tropaeolaceae, N. Amer. Fl. 25: 89–91. 1910.

Annual or perennial herbs, sometimes with tuberous roots, usually twining and glabrous or nearly so; leaves alternate, generally long-petiolate and peltate, usually angulate or palmate-lobate; peduncles axillary and 1-flowered, rarely umbellately several-flowered; flowers irregular, perfect, yellow or red, the hypanthium produced posteriorly as a spur; sepals 5, imbricate or valvate, connate at the base; petals 5 or rarely by abortion fewer, imbricate, the upper ones exterior and more or less unlike the lower ones; stamens 8, free, unequal, declinate; ovary 3-lobate, 3-celled; style 1, apical, filiform, the branches short, introrsely stigmatose; ovules solitary, pendulous from the apex of the cell; carpels of the fruit finally separating from the axis, indehiscent, indurate-fleshy, rugose; seeds without endosperm, the cotyledons thick-carnose, the radicle very short.

The family consists of a single genus.

TROPAEOLUM L. Nasturtium

Species 50 or more, all American, and chiefly in the Andes of South America. Five have been reported from Chiapas and Central America, but the number is very uncertain and probably lower. In spite of the fact that the Central American and other species have been "monographed" during the present century, one of the treatments is wholly worthless and the other little better.

Petals entire, mostly 2.5–3 cm. long or even larger; cultivated plants *T. majus*.

Petals acutely dentate, about 1 cm. long; native plants *T. Moritzianum*.

***Tropaeolum majus* L. Sp. Pl. 345. 1753. *Mastuerzo*; *Capuchina*. *Nasturtium*.**

Native of the Andes of South America; planted for ornament generally in temperate and in tropical regions; grown commonly in Guatemala at all elevations at which gardens are found, rarely more or less naturalized in thickets.

Plants glabrous, low and suberect or often with much elongate, scandent stems; leaves on very long petioles, the blades peltate near the center, suborbicular, scarcely lobate, glaucous beneath; flowers long-pedunculate, in various shades of yellow, orange, and dark red.

The common nasturtium thrives in Guatemalan gardens, and in some regions, as about Cobán, grows luxuriantly with little care. All parts of the plant have an agreeable pungent flavor, and in the United States the green fruits and seeds often are added to cucumber or other pickles to flavor them. The leaves also may be eaten raw in salads. Both the dwarf and scandent forms are grown in Guatemala, the seeds generally being imported from the United States, like those of most garden flowers. Some of the South American species of this genus are cultivated in the Andes for their edible tubers.

***Tropaeolum Moritzianum* Klotzsch, Allg. Gartenz. 6: 241. 1838. *T. emarginatum* Turcz. Bull. Soc. Nat. Moscou 31, pt. 1: 425. 1858 (type from San Bartolo, Chiapas). *T. guatemalense* Suesseng. Repert. Sp. Nov. 51: 205. 1942. *Campanita*; *Mastuerzo*; *Martuezo* (a corruption of *Mastuerzo*); *Hoja de esperanza*.**

Moist or wet thickets or rather open, mixed forest, 1,200–2,850 meters; Alta Verapaz; El Progreso; Suchitepéquez; Quezaltenango; San Marcos; reported from Sacatepéquez. Chiapas; Costa Rica; northwestern South America.

A small or often very large, glabrous vine, climbing over shrubs or often over small trees and forming dense tangles of slender stems; leaves on very long petioles, peltate remote from the center, 5–10 cm. wide, usually broader than long, glaucous beneath, shallowly lobate, the lobes rounded and mucronate; peduncles long and slender; spur of the flower 2–2.5 cm. long, straight; sepals 8–12 mm. long, ovate, obtuse, scarlet or rather deep red; petals bright yellow, slightly longer than the sepals, incised dentate, long-unguiculate.

There is some uncertainty regarding the proper specific name for this plant. It is certainly *T. emarginatum* Turcz. and probably is properly referable to *T. Moritzianum*, to which the former was referred doubtfully by Buchenau. The Guatemalan plant has been reported also as *T. emarginatum* Turcz. In general appearance, the plant is much like *T. majus*, but usually much larger, its stems often forming dense drapes over the smaller trees, especially in the mountains of Quezaltenango. The red and yellow flowers are rather small, not produced in profusion, and the plant has little ornamental value. We have not seen the description of *T. guatemalense*, and that may be really the proper name for the Guatemalan plant.

LINACEAE. Flax Family

Reference: John Kunkel Small, *Linaceae*, N. Amer. Fl. 25: 67–87. 1907.

Herbs or shrubs with branched stems; leaves alternate, opposite, or verticillate, without stipules or with stipular glands, usually narrow and entire; flowers small or rather large, perfect, regular and usually symmetric, racemose, paniculate, or cymose; sepals normally 5, entire or glandular-dentate; petals generally 5, white, yellow, or blue, ephemeral; stamens as many as the petals, the filaments united at the base, sometimes bearing entire or bilobate staminodia in the sinuses; anthers 2-celled, versatile; gynoecium 5-carpellary or sometimes 2–3-carpellary, the carpel bodies united, often with complete or incomplete partitions; styles distinct or partially united, the stigmas terminal or introrse; ovules 1–2 in each cell; fruit capsular, usually separating into twice as many parts as there are carpels; seeds compressed or turgid, oily.

Ten genera, widely distributed. Only one genus is native in North America.

LINUM L.

Plants herbaceous or suffrutescent, glabrous or pubescent; leaves small, alternate or often opposite or verticillate, entire, 1–many-nerved; flowers mostly small, chiefly in racemes or cymes, blue or yellow; sepals 5, entire or glandular-dentate; petals 5, contorted, fugacious; stamens united at the base, hypogynous, alternating with the petals, with interposed staminodia; ovary 5-celled, the cells 2-ovulate, falsely 2-locellate; styles 5, free or somewhat united below, the stigmas capitate, oblong, or linear; capsule septicidally 5-valvate; endosperm scant, the embryo straight.

About 80 species in both hemispheres, mostly in temperate or subtropical regions. In tropical regions most of the species are confined to the mountains. Only the following species are known from Central America.

Petals blue, 1-1.5 cm. long; sepals without glands. *L. usitatissimum*.
 Petals yellow, small; sepals glandular-dentate.

Leaves lanceolate to spatulate or oblong.

Leaves all or mostly alternate. *L. guatemalense*.

Leaves mostly verticillate, the uppermost alternate. *L. Schiedeannum*.

Leaves narrowly linear. *L. rupestre*.

Linum guatemalense Benth. Bot. Voy. Sulph. 67. 1844 (type collected in Guatemala by Skinner, the locality unknown). *Cathartolimum guatemalense* Small, N. Amer. Fl. 25: 79. 1907.

Moist banks, fields, or thickets, often in oak or pine forest of the mountains, 1,500-3,000 meters; probably endemic; El Progreso; Jalapa; Guatemala; Sacatepéquez; Chimaltenango; Quiché; Quezaltenango; Huehuetenango.

Plants annual or perennial, usually with several or numerous stems, these slender, stiff and wiry, erect, a meter high or less, terete or angulate, often purplish, glabrous throughout or nearly so, paniculately branched above; leaves ascending, all except sometimes the lowest alternate, rather thin, sessile, lanceolate or linear-lanceolate, mostly 2-3 cm. long, acute or acuminate, slightly paler beneath, the lateral nerves obscure; flowers small, yellow, in small cymes disposed in large narrow panicles; outer sepals oblong-ovate, 3-3.5 mm. long, entire or with 1-2 teeth near the base, the inner sepals glandular-dentate; filaments glabrous, the staminodia slender-subulate; styles united below the middle; capsule globose-ovoid, glabrous, 2.5 mm. long.

The flowers are small and not at all conspicuous. The plant is plentiful in many places of the central mountains.

Linum rupestre (Gray) Engelm. Bost. Journ. Nat. Hist. 6: 232. 1850. *L. Boottii* var. *rupestre* Gray, Bost. Journ. Nat. Hist. 6: 155. 1850.

Rocky limestone slopes, 800-1,500 meters; Huehuetenango. Southwestern United States; Mexico.

A stiff erect perennial herb, 20-40 cm. high, the stems several, very slender, bright green, glabrous, sparsely corymbose-branched above, the branches terminating in irregular, remotely rather few-flowered cymes; leaves approximate at the base of the plant, sparse above, erect or appressed, soon deciduous, the principal cauline ones narrowly linear or subulate, the basal ones linear-spatulate, mostly 1 cm. long or shorter, entire; bracts subulate, glandular-dentate; outer sepals oblong to lanceolate, in age 3-4 mm. long, persistent, short-acuminate, glandular-

dentate; inner sepals oval to ovate, glandular-denticulate; petals yellow, scarcely 5 mm. long; ovary glabrous; capsule globose-ovoid, 2.5 mm. long.

***Linum Schiedeianum* Schlecht. & Cham. Linnaea 5: 234. 1830.**

Chiefly in damp thickets, forest, or fields, often in pine forest, sometimes in rather dry, open, rocky situations, 1,200–2,500 meters; Alta Verapaz; Baja Verapaz; El Progreso; Guatemala; Huehuetenango; Quiché. Mexico; mountains of Honduras.

Plants annual or perennial, very slender, often with numerous stems, usually 50 cm. high or less, often glaucescent, erect or nearly so but rather weak, corymbosely branched above, the flowers in rather compact cymes, the stems striate, glabrous or somewhat pilose; leaves small, mostly verticillate, sessile, spatulate to oblong, linear-oblong, or often rounded-oval, mostly 7–15 mm. long, obtuse or rounded at the apex, thin, ascending or spreading; outer sepals oblong or oblong-lanceolate, becoming 3.5–4 mm. long in age, subacuminate, glandular-dentate; petals small, yellow; filaments glabrous, the staminodia bilobate; ovary glabrous, the styles distinct; capsule ovoid, 2 mm. long, about equaling the sepals.

Seler 2913 and 3135, reported by Loesener as *Linum tenellum* Cham. & Schlecht. (the determination by Capt. Smith) and collected at Chaculá, Huehuetenango, may belong to this species. *L. Crucjata* Planch., collected by Bernouilli and so reported by Hemsley, likewise may be *L. Schiedeianum*. This also is a small and inconspicuous plant, much less showy than some of the northern species with large yellow flowers. *L. Schiedeianum* seems to be much more plentiful in Alta Verapaz than elsewhere in Guatemala.

Linum usitatissimum* L. Sp. Pl. 277. 1753. *Lino. Flax.

Probably native of Europe and western Asia, but apparently unknown at present in a wild state; cultivated in Europe and Asia since ancient times. Cultivated on a small scale in the highlands of Guatemala for its seeds, and often grown in gardens for ornament.

A slender erect annual a meter high or less, glabrous; leaves alternate, sessile, erect or ascending, mostly linear and 2–3 cm. long; flowers slender-pedicellate; sepals acuminate, 7–9 mm. long in fruit; capsule 6–8 mm. high.

We have seen flax planted in fields on the plains near Tecpán, where a few acres have been noted during two different seasons. Flax doubtless could be grown here on a larger scale for its seeds, which are the source of linseed oil. The seeds exude mucilage when wet, and because of this property they are sometimes used to remove a foreign body from the eye. The flowers are beautifully colored, and a large flax field in full bloom, such as may be seen by thousands of acres in the Dakotas, is a glorious sight. One of the two chief

uses of the plant is for fiber, flax fiber having been highly esteemed for thousands of years for weaving fine and durable linen cloth.

ERYTHROXYLACEAE. Coca Family

References: O. E. Schulz, Erythroxylaceae, Pflanzenreich IV. 134. 1907; Nathaniel Lord Britton, N. Amer. Fl. 25: 59-66. 1907.

Glabrous trees or shrubs; leaves alternate, simple, entire, stipulate, petiolate, the petioles usually short; stipules often imbricate on young branches; flowers small, perfect or subdioecious, often heterostylous, solitary or fasciculate in the leaf axils, pedicellate, the pedicels bracteate at the base, usually angulate; calyx persistent, cleft into 5 lobes or of 5 distinct sepals; petals as many as the calyx segments, hypogynous, with a bilobate liguliform appendage within; stamens 10, biseriate, the filaments united below to form a tube, this often 10-crenulate; ovary 3-celled, the cells containing 1 or rarely 2 ovules, these pendulous; styles 3, mostly distinct, the stigmas capitate; fruit drupaceous, commonly 1-celled and 1-seeded; testa thin; endosperm farinaceous, sometimes scant or none, the embryo straight.

One other genus is known, with a single species in West Africa.

ERYTHROXYLON L.

About 200 species, in the tropics of both hemispheres, but most numerous in America. A few additional species occur in other parts of Central America. The best known member of the genus is *E. Coca* Lam. of the South American Andes, especially of Peru, from whose leaves is obtained the drug cocaine. This shrub is planted sometimes as a curiosity in Central America and is planted in some of the gardens of Guatemala City and perhaps elsewhere. The leaves with lime have long been chewed by the Andean Indians, partly to remedy fatigue. An isolated outpost of the coca cult is found as far north as the Santa Marta Sierra Nevada of Colombia.

Leaves acute or acuminate.

Stipules very large, mostly 1-2.5 cm. long. *E. tabascense*.

Stipules only 2-3 mm. long. *E. panamense*.

Leaves rounded, emarginate, or very obtuse at the apex.

Leaves orbicular or orbicular-obovate, mostly 6-15 mm. long. *E. fiscalense*.

Leaves mostly obovate to oval-obovate or oval-elliptic, usually more than 1.5 cm. long and often 6-8 cm.

Leaf blades chiefly 1.5-2.5 cm. long, sometimes cuneate at the base.

Leaves cuneate-obovate, acutely cuneate at the base. *E. rotundifolium*.

Leaves broadly elliptic or rounded-elliptic, mostly obtuse at the base.

E. pallidum.

Leaf blades mostly 4.5-7 cm. long, chiefly oval-elliptic or elliptic-oblong, usually not cuneate at the base.

Fruiting pedicels 8–10 mm. long; fruit about 13 mm. long; leaves green or brownish beneath, not conspicuously areolate *E. belizense*.

Fruiting pedicels mostly 5 mm. long or less; fruit about 9 mm. long; leaves usually glaucescent or pale beneath and conspicuously areolate by 2 lines parallel with the costa, the areolation sometimes obscure.

E. areolatum.

Erythroxylon areolatum L. Syst. Nat. ed. 10. 1035. 1759.
Limoncillo (Petén).

Moist or wet thickets, 800 meters or less; Petén; Izabal; Escuintla. Tabasco to Yucatan and British Honduras; West Indies.

A shrub or small tree, sometimes 9 meters high with a trunk 20 cm. in diameter, but usually smaller; leaves on petioles 4–6 mm. long, elliptic-oblong to elliptic-obovate, rather thin, 5–13 cm. long, 3–5.5 cm. wide, rounded or obtuse and often emarginate at the apex, obtuse or subacute at the base, deep green above, pale and usually glaucescent beneath, areolate by 2 conspicuous lines parallel with the costa, or the areolation often obscure; stipules triangular, acute, 2 mm. long; pedicels fasciculate, in fruit about equalling the petioles; flowers appearing before or with the new leaves, white or yellowish white, fragrant; calyx cleft to the middle, 2 mm. long, the segments triangular-ovate, acute; petals oblong, obtuse, 2–3 mm. long; fruit oblong, red, obtuse, obtusely trigonous, 6–9 mm. long.

Known in British Honduras as “redwood,” “ridge redwood,” or “swamp redwood.” The wood is reddish brown, with oily appearance, hard, heavy, fine-textured, irregularly grained, very durable.

Erythroxylon belizense Lundell, Phytologia 1: 215. 1937.

Type collected in open secondary forest on top of limestone hill, San Agustín, Mountain Pine Ridge, El Cayo District, British Honduras, *Lundell* 6810.

A shrub 2 meters high with brown or fuscous branches; stipules broadly triangular, 3.5–4 mm. long; petioles 3–5 mm. long; leaves rather thick, elliptic-oval, 3–6 cm. long, 2–3 cm. wide, rounded or very obtuse at the apex and sometimes subemarginate, obtuse at the base, deep green and lustrous above, somewhat brownish beneath, not or scarcely areolate; fruiting pedicels 1–3 in an axil, 8–10 mm. long; fruiting calyx deeply 5-fid, the lobes ovate-triangular, acute; fruit ovoid-oblong, narrowed at the apex, bright red, about 13 mm. long and 5–6 mm. broad.

Additional material will be necessary to determine the validity of this species, which is closely related to *E. areolatum*.

Erythroxylon fiscalense Standl. Field Mus. Bot. 22: 33. 1940.
Frutilla.

Dry rocky thickets, 250–1,200 meters; endemic; Zacapa; Chiquimula; Guatemala (type from Fiscal, *Standley* 59568).

A very densely branched, stiff shrub 1.5-3 meters high, the branchlets short or elongate, fuscous-ferruginous, sometimes spinose; stipules ovate, acute, 2 mm. long; leaves on petioles 2 mm. long or less, orbicular or obovate-orbicular, mostly 6-15 mm. long and almost as broad, broadly rounded at the apex, broadly obtuse at the base, green above, slightly paler beneath, the costa prominent, the other venation obsolete; fruit oblong, bright red, 7-8 mm. long.

A characteristic hillside shrub of the dry Zacapa-Chiquimula region.

Erythroxylon pallidum Rose, Contr. U. S. Nat. Herb. 8: 314. 1905.

At about 1,200 meters; Huehuetenango (along Río Cuilco between Cuilco and San Juan, *Steiermark* 50873). Zacatecas, Mexico; Salvador(?).

A shrub 2.5-4.5 meters high, glabrous throughout, the branches stout, blackish or dark brown; stipules ovate, acute, 1.5 mm. long; leaves thin, on slender pale petioles 4-8 mm. long; leaf blades broadly elliptic or rounded-elliptic, 2-3 cm. long, 2 cm. wide or narrower, broadly rounded at the apex and often emarginate, usually obtuse at the base, sometimes subacute, yellowish green on the upper surface, paler beneath, not areolate, the venation laxly reticulate on the upper surface but not conspicuous; pedicels axillary, solitary or geminate, in fruit 2-4 mm. long, thickened upward; fruiting calyx 1.5 mm. long, the lobes triangular-ovate; fruit oblong, 8 mm. long.

The determination of the Guatemalan material is perhaps questionable, but it can be referred here satisfactorily enough. In this group of the genus there are already enough described species of doubtful status, so that it is inadvisable to add further to the number. The range, as cited above, is a natural one.

Erythroxylon panamense Turcz. Bull. Soc. Nat. Moscou 36, pt. 1: 581. 1863.

Wet forest along streams, little above sea level; Izabal (Río Perdonales, Jocoló, *Harry Johnson* 1100). Panama.

A glabrous shrub of 1-2 meters, the branches slender, brown, conspicuously lenticellate; stipules triangular-ovate, acute, 2-3 mm. long; leaves rather thin, on petioles 2-4 mm. long, lanceolate or oblong-lanceolate, 4.5-10 cm. long, 1.5-3 cm. wide, acute, narrowed to the cuneate base, green above, slightly paler and evidently areolate beneath, rather conspicuously but laxly reticulate-veined when mature, often lustrous; flowers in fascicles of 4-6, the pedicels 1-3 mm. long; calyx 1.5 mm. long, cleft to below the middle, the lobes ovate, acute; petals oblong-obovate, obtuse, 3 mm. long, white, the lobes of the ligule oblong, irregularly crenate, one-third as long as the blade; stamen tube almost truncate; fruit narrowly oblong, red, 1 cm. long.

The Guatemalan material is noteworthy for its rather small leaves but further collections probably will show that it is not

essentially different from *E. panamense*. We gave the single collection a provisional name as a new species, but fortunately it has not been published.

Erythroxylon rotundifolium Lunan, Hort. Jam. 2: 116. 1814. *E. brevipes* DC. Prodr. 1: 573. 1824. *E. suave* O. E. Schulz in Urban, Symb. Antill. 5: 197. 1907. *E. sessiliflorum* O. E. Schulz, Pflanzenreich IV. 134: 69. 1907 (type from Chicankanab, Yucatan).

Yucatan and Campeche; perhaps also (sterile material) in Zacapa, 600–650 meters.

A shrub or small tree, the bark smooth; leaves on petioles 2.5–5 mm. long, broadly obovate to obovate-oblong, mostly 1–2.5 cm. long, thin or subcoriaceous, rounded or emarginate at the apex, cuneate at the base, deep green above, pale beneath, not areolate; stipules 1–1.5 mm. long, ovate or ovate-lanceolate, acute or acuminate; flowers 1–4 in an axil, the pedicels about equaling the petioles; calyx 1 mm. long, cleft to the middle, the lobes triangular-ovate, acute; petals white, 1.5–2.5 mm. long, oblong, obtuse; fruit red, oblong, 4–6 mm. long, obtuse.

E. brevipes has been regarded as a distinct species, but the supposed characters by which it has been separated from *E. rotundifolium* seem not to exist. The Maya name of Yucatan is reported as "iciche." *E. sessiliflorum* was based upon somewhat abnormal material with unusually narrow leaves and short pedicels.

Erythroxylon tabascense Britton, N. Amer. Fl. 25: 66. 1907.

Wet forest or thickets, sometimes in second growth, often along streams, ascending from sea level to about 1,300 meters; Alta Verapaz (Cubilgüitz); Izabal; San Marcos. Tabasco (type from San Sebastián); British Honduras.

A shrub or tree, sometimes 12 meters tall, but often flowering when only a shrub of 2 meters; stipules linear-lanceolate, about 1 cm. long or often as much as 2.5 cm., nerved; leaves on short stout petioles, mostly elliptic-oblong, 8–18 cm. long, 4–7 cm. wide, abruptly acute to long-acuminate, acute or subobtuse at the base, deep green and lustrous above, much paler beneath, not areolate, thick and subcoriaceous; flowers mostly in dense fascicles, the stout pedicels 2–6 mm. long; calyx lobes ovate, acute or acuminate, 2–3 mm. long; petals white or pale yellow, oval, slightly longer than the sepals; fruit oblong-ellipsoid, 1 cm. long, turning yellow and finally red, obtuse.

Called "zapotillo" in Tabasco, where an infusion of the leaves is said to be used as a beverage.

ZYGOPHYLLACEAE

Reference: Anna Murray Vail and Per Axel Rydberg, Zygophyllaceae, N. Amer. Fl. 25: 103–116. 1910.



Annual or perennial herbs, shrubs, or trees, frequently strong-scented and resinous, the branches often with articulate nodes; leaves opposite or alternate, stipulate, simple, digitately compound, or pinnate, the leaves or leaflets entire; flowers perfect, regular or nearly so; sepals usually 5 and free, commonly imbricate; petals 5, free, imbricate, valvate, or convolute; stamens twice as many as the petals, biseriate, the filaments subulate, naked or appendiculate at the base, the outer stamens larger than the inner; anthers versatile, introrse, longitudinally dehiscent; ovary of 2-5 united carpels, sessile or short-stipitate, terminated by a common style, the stigmas entire and clavate or lobate, papillose; ovules 1 or several in each cell, pendulous or ascending; fruit capsular or separating into few or several, often spine-armed nutlets; seeds with or without endosperm, the embryo straight or curved; cotyledons carnose, linear or oblong.

About 20 genera, widely dispersed in tropical and warm regions. Only the following genera are known in Central America.

- Trees; petals blue or purple. *Guaiacum*.
 Herbs, usually prostrate; petals yellow.
 Carpels of the fruit armed with spines. *Tribulus*.
 Carpels of the fruit unarmed. *Kallstroemia*.

GUAIAECUM L. *Lignum-vitae*

Small or large trees with very hard and heavy, resinous wood, the nodes of the branches often swollen; leaves opposite, petiolate, abruptly pinnate, the leaflets 2-several pairs; stipules minute; flowers clustered, pedunculate, blue or purple; sepals 4-5, somewhat united at the base; petals 4-5; stamens 8-10, the filaments filiform, the anthers cordate or sagittate; ovary stipitate, 2-5-lobate, 2-5-celled, the style subulate; ovules 8-10 in each cell, anatropous; fruit dry, coriaceous, with 2-5 wing-like angles; seeds ovoid or ellipsoid, the embryo almost straight.

Probably about 3 species, ranging from southern Florida and Mexico to northern South America. In Central America one other species is known, *G. officinale* L. in Panama.

***Guaiacum sanctum* L. Sp. Pl. 382. 1753. *G. guatemalense* Planch. ex Rydb. N. Amer. Fl. 25: 106. 1910 (type from plains of Zacapa, Skinner). *Guayacán*.**

Plentiful on dry rocky hillsides of the lower Motagua Valley, at 250 meters or less, also frequent on the Pacific plains, at or near sea level; El Progreso; Zacapa; Suchitepéquez; Retalhuleu. Southern Florida; Yucatan; Honduras; Nicaragua; Panama; West Indies; northern South America.

A small or sometimes rather large tree or a large shrub, sometimes 10 meters tall, with dense spreading crown and a thick trunk rarely more than 30 cm. in diameter, the bark pale; leaflets 4-12, oblong to obovate, 2-3.5 cm. long, sessile, coriaceous, glabrous or sparsely sericeous, obtuse or rounded at the apex; stipules 3 mm. long, pubescent, caducous; flowers solitary or several together, on pubescent

peduncles shorter than the leaves; sepals obovate or oblong-obovate, 5-7 mm. long; petals blue or purple, broadly obovate, 7-12 mm. long, rounded at the apex, glabrous; capsule broadly obovoid, yellow or orange, about 1.5 cm. long; seeds ellipsoid, dark brown or black, 1 cm. long, with a red aril.

Called "palo santo" in Yucatan, whence the Maya name is reported as "zon" or "zoon." The tree is best known for its wood, which is olive-brown to dark brown or nearly black, oily or waxy; sapwood white or yellowish, sometimes with blue or greenish vessel lines; it is mildly and pleasantly scented, and has a somewhat acrid taste; extremely hard and heavy, the specific gravity 1.17-1.32; grain interwoven, the texture fine and uniform; difficult to work; takes a high natural polish; very durable. The wood has been an article of trade since it was introduced into Europe about 1508 because of its medicinal properties. It was long supposed to be a remedy for many ailments, especially for venereal diseases. Many learned treatises were published upon the properties of the tree, and its reputation was so firmly established that for two centuries its therapeutic value remained unquestioned. It is now believed that *lignum-vitae* has little effect upon the diseases for whose treatment it was most esteemed. The extract of the wood is, however, official in the U. S. Pharmacopoeia and is stated to have stimulant and diaphoretic properties.

Lignum-vitae wood is used chiefly for bearings or bushing blocks for the linings of stern tubes of propeller shafts of steamships. Its great strength and tenacity combined with its self-lubricating properties due to the resin content make it especially adaptable for bearings under water. It is employed in the United States for such articles as mallets, pulley sheaves, caster wheels, bowling balls, stencil and chisel blocks, various turned articles, and brush backs. The principal source of the *lignum-vitae* of commerce is *Guaiaacum officinale* L., of the West Indies, southern Central America, Colombia, and Venezuela, but the wood of *G. sanctum* also is used, being sometimes called bastard *lignum-vitae* in the trade. Small amounts of it are exported from Guatemala, at least from Suchitepéquez and Retalhuleu. The Guatemalan government is said to own there a considerable stand of the tree, but the government does not permit exploitation of these trees. It is stated that few exploitable trees are available, but small trees and shrubs are a conspicuous part of the coastal thickets in some regions of the departments named.

It is reported that the Mayas of the Yucatan Peninsula used the wood for making dishes, cups, and bows. Tozzer notes that the

Lacandón Indians, at least until recently, also made bows of *lignum-vitae*. The term "guayacán" is believed to be an Antillean name for the tree which, since it grows only in the coastal regions, probably never received a Nahuatl name. The trees are exceedingly handsome when in blossom, about the end of the dry season (they were noted in bloom in the Motagua Valley in late April), and attract attention because of their dense masses of blue, a rare color in the tropics. In the Comayagua Valley of Honduras this tree is reported to attain a height of 24 meters, but usually it is much lower.

KALLSTROEMIA Scopoli

Annual or perennial herbs, the stems usually prostrate; leaves abruptly pinnate, the stipules subulate; flowers solitary, orange or yellow, the peduncles axillary; sepals 5-6, lanceolate to linear-subulate, persistent; petals 4-6, obovate or obcordate, spreading, longer than the sepals, caducous; stamens 10-12, the filaments filiform; ovary sessile, 8-12-celled, the styles united, columnar or subulate from a conic base, the stigma capitate; fruit sometimes roughened or tuberculate, separating at maturity into 10-12 osseous indehiscent 1-seeded nutlets, leaving the persistent central axis; seeds obovate, with a membranous testa.

About 12 species, widely distributed in tropical and warmer regions, chiefly in Mexico. Only the following are known from Central America.

Fruit glabrous; beak of the fruit about equaling the body.....*K. maxima*.
Fruit strigose.

Petals 6-7 mm. long; beak of the fruit nearly as long as the body; plants usually erect or ascending.....*K. caribaea*.

Petals 3-5 mm. long; beak of the fruit much shorter than the body; plants prostrate.....*K. brachystylis*.

Kallstroemia brachystylis Vail, Bull. Torrey Club 24: 206. 1897.

Moist fields, 200 meters; Zacapa (Zacapa, Standley 73599). Southwestern United States; Mexico.

Plants annual, much branched, prostrate and often forming dense mats, the stems mostly 40 cm. long or less, sparsely or densely appressed-pilose; stipules lanceolate or ovate-lanceolate, 4-5 mm. long, deciduous; leaves short-petiolate, the leaflets 3-4 pairs, obliquely elliptic or oval, 6-15 mm. long, ciliate, pilose when young, glabrate in age, obtuse or rounded at the apex; peduncles 2 cm. long or usually much shorter, mostly 1 cm. long or less; sepals lanceolate, often caducous; petals 4-5 mm. long, orange to pale yellow, sometimes shorter than the sepals; fruit strigose, the beak persistent, glabrous, 2 mm. long, shorter than the body; nutlets 8-10, about 3 mm. long, with coarse rounded dorsal tubercles.

Kallstroemia caribaea Rydb. N. Amer. Fl. 25: 111. 1910.

Moist thickets, 200 meters; Zacapa (Zacapa, *Standley* 74607). Honduras; Costa Rica; West Indies; Colombia and Venezuela.

A branched annual, erect or ascending, 50 cm. high or less, the slender pale stems variously pubescent; stipules lanceolate, 3 mm. long; leaves short-petiolate, the leaflets usually 6, obliquely elliptic or oval, rounded and mucronate at the apex, 1-2 cm. long, appressed-pilose, or glabrate above; peduncles in fruit 1.5-4.5 cm. long; sepals linear-lanceolate, hispidulous, 5 mm. long; petals pale buff, obovate, 6-7 mm. long; fruit rather densely strigose, the beak 4 mm. long, about equaling the body; nutlets tuberculate dorsally, the faces reticulate.

There is some difference of opinion as to how the species of this genus should be defined, and the characters for separating them are usually rather vague and unsatisfactory. This and *K. brachystylis* are distinct from *K. maxima* in their strigose rather than glabrous fruit, a character that probably is a good basis for specific segregation. The species with strigose fruit, however, are not usually clearly defined, and it is sometimes difficult to determine what names should be assigned them, assuming that they are distinct. It appears that there are two fairly distinct species of this alliance in Guatemala.

Kallstroemia maxima (L.) Torr. & Gray, Fl. N. Amer. 1: 213. 1838. *Tribulus maximus* L. Sp. Pl. 386. 1753.

Moist thickets or plains, often in sand or a weed in cultivated ground, 1,500 meters or less, chiefly near sea level; Petén; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Suchitpéquez; Retalhuleu; Sololá; Quiché; Huehuetenango; San Marcos. Southern United States to Mexico and British Honduras, southward to Panama; West Indies; South America.

A much-branched annual, the stems prostrate, a meter long or less, prostrate and often forming dense mats, appressed-pilose; stipules 5 mm. long, persistent; leaflets 3-4 pairs, obliquely oblong or oval, 5-20 mm. long, obtuse or rarely acutish, apiculate, sparsely or rather densely appressed-pilose, the terminal ones usually largest; peduncles 1-4 cm. long; sepals scarious-margined, ciliate and pubescent; petals 7-8 mm. long; fruit glabrous; carpels of the fruit 10, glabrous.

Kallstroemia maxima is a weedy plant, inconspicuous in spite of its yellow flowers, which are small and unattractive. In Salvador the plant is known variously as "taraya," "golondrina," "verdolaga," "verdolaguita," and "hierba de parra."

TRIBULUS L.

Prostrate, annual or perennial herbs, the stems branched; leaves abruptly pinnate, the stipules membranaceous, lanceolate or subulate; flowers axillary,

solitary, long-pedunculate; sepals 5, lanceolate, herbaceous, caducous; petals 5, obovate, yellow or orange, spreading, larger than the sepals; stamens 10, the filaments filiform, the 5 inner ones shorter, the anthers cordate or oblong; ovary sessile, 5-celled, surrounded at the base by an urceolate 10-lobate disk, the styles united into a short thick column; stigmas 5, more or less connate; ovules 5-10 in each cell, obliquely pendulous, anatropous; fruit depressed, 5-angulate, usually covered with short thick spines, separating at maturity into 5 bony carpels, leaving no central axis, the carpels divided by transverse septa into 3-5 one-seeded compartments; seeds oblong-obovate, without endosperm, the testa membranaceous.

About 10 species, in warm or tropical regions. A single species is known from Central America.

Tribulus cistoides L. Sp. Pl. 387. 1753. *T. alacranensis* Millsp. Field Mus. Bot. 2: 54. 1900. *Abrojo*.

Dry or moist fields or banks, often along roadsides or on railroad embankments, 450 meters or less; Izabal; Zacapa; El Progreso; Escuintla. Southern United States to Mexico; West Indies; South America.

Plants prostrate, annual or perennial, the stems branched, mostly 50 cm. long or less, pilose with appressed or spreading hairs; stipules subulate, 5-8 mm. long; leaflets 6-8 pairs, obliquely oblong or elliptic, 5-15 mm. long, subacute or obtuse, densely sericeous beneath and often also above; peduncles 3-4 cm. long; petals bright yellow, 1-2.5 cm. long; ovary hirsute; fruit hard and bony, bearing a few long stout hard spines.

Maya names reported from Yucatan are "chanxnuuc," "chanixnuc," and "chanxnuc." The plant is said to be eaten by stock. It is showy and rather handsome because of its large golden flowers, but the sharp-spined fruits are a great nuisance, and they must be a pest to bare-footed people of regions where the plant grows.

RUTACEAE. Rue Family

Reference: Percy Wilson, Rutaceae, N. Amer. Fl. 25: 173-224. 1911.

Trees, shrubs, or rarely herbs, aromatic, sometimes armed with spines or prickles, occasionally scandent, with secreting glands in foliage, bark, and fruit; leaves alternate or opposite, pinnately or digitately compound, sometimes 1-3-foliate or simple, without stipules, almost always with translucent oil glands; flowers perfect, polygamous, or dioecious, in axillary or terminal cymes, panicles, racemes, spikes, or fascicles, sometimes solitary; calyx with 3-5 lobes or sepals, rarely none; petals 3-5 or rarely more, usually imbricate, sometimes united; stamens as many as the petals or twice as many, rarely more numerous, the filaments distinct or united below, inserted on a hypogynous disk or sometimes adnate to the corolla tube; anthers introrse, 2-celled, often gland-tipped; carpels of the ovary 1-5 or more, sessile or stipitate, free or united; styles free or connate, terminal

or lateral, the stigma simple or lobate; ovules 2 or rarely 4 or more in each cell; fruit of follicles or a samara, drupe, or berry, the seeds solitary or several in each cell, with or without endosperm; radicle superior.

About 120 genera, widely distributed, mostly in tropical regions. The only other genera known from Central America are *Erythronchiton* and *Ravenia*.

Plants herbaceous; leaves 2 or more times divided; petals laciniate. *Ruta*.

Plants shrubs or trees; leaves pinnate or digitate, or simple; petals not laciniate.

Fruit baccate or drupaceous.

Stamens 20-60; cells of the fruit several-seeded; plants usually armed with spines. *Citrus*.

Stamens 4-10; cells of the fruit 1-2-seeded.

Plants armed with spines; cultivated species. *Triphasia*.

Plants unarmed; native species.

Leaves digitately compound. *Casimiroa*.

Leaves pinnate or 1-foliolate.

Style none or very short; native species. *Amyris*.

Style equaling or longer than the ovary; cultivated species. . *Muraya*.

Fruit a capsule or of 1 or more follicles, dry.

Petals united for half their length or more; filaments more or less adnate to the corolla tube. *Galipea*.

Petals free; filaments free from the corolla.

Leaves 1-foliolate. *Decazyx*.

Leaves with 3 or more leaflets.

Flowers solitary, very large, 3-4 cm. wide; leaves digitately compound. *Peltostigma*.

Flowers not solitary, small.

Stamens as many as the petals.

Leaves 1-3-foliolate or pinnate; plants often armed with prickles. *Zanthoxylum*.

Leaves digitately compound; plants unarmed. *Esenbeckia*.

Stamens twice as many as the petals; petals unarmed.

Ovary 2-celled; calyx 4-parted; leaflets small, 1.5 cm. long or less, not tomentose. *Megastigma*.

Ovary 5-celled; calyx 5-dentate; leaflets large, 7-13 cm. long, tomentose beneath. *Decatropis*.

AMYRIS L.

Shrubs or trees, unarmed, glabrous or pubescent; leaves opposite or alternate, 1-3-foliolate or pinnate, the rachis sometimes winged; inflorescence ovoid-paniculate or corymbiform, few-many-flowered, or the flowers sometimes solitary, perfect, white or yellowish white, the pedicels 2-bracteate; hypanthium urceolate, the sepals 4-5; petals 4-5; stamens twice as many as the petals, inserted on the disk, the filaments filiform, the anthers longitudinally dehiscent; ovary 1-celled, the style short and terminal or wanting, the stigma capitate; ovules 2, pendulous

from the apex of the cell; fruit drupaceous, black or reddish; seeds solitary, with membranaceous testa; cotyledons plano-convex, carnose, glandular-punctate.

An American genus with about 18 species, distributed from southern Florida and Mexico to the West Indies and northern South America. Four other species are known from Central America.

Leaflet 1, the leaves appearing simple. *A. belizensis*.

Leaflets 3 or more.

Leaflets 5-7, 3 cm. long or less. *A. rhomboidea*.

Leaflets usually 3, sometimes 5, mostly 3-10 cm. long.

Leaves alternate. *A. sylvatica*.

Leaves opposite or subopposite. *A. elemifera*.

Amyris belizensis Lundell, Contr. Univ. Mich. Herb. 6: 32. 1941.

Known only from the type, collected on top of a limestone hill, Gracie Rock, Sibun River, Belize District, British Honduras, *P. H. Gentile* 1720.

A small tree, the trunk 20 cm. in diameter, the young branchlets slender, puberulent at first; petioles scarcely more than 1 mm. long; leaves 1-foliate, alternate, the leaflet lanceolate, firm-membranaceous, 4.5-9.5 cm. long, 2-3 cm. wide, narrowly long-acuminate, acute or obtuse at the base, glabrous, the lateral nerves slender and inconspicuous, 7-9 pairs; flowers and fruits unknown.

Known only from sterile material, the status of this species is uncertain. Except the very short petioles, there is no apparent character separating it from *A. attenuata* Standl. of Honduras, to which very probably it will have to be referred ultimately.

Amyris elemifera L. Syst. Nat. ed. 10. 1000. 1759.

Brushy rocky hillsides or ravines, sometimes on limestone, 350-1,000 meters or less; Alta Verapaz; El Progreso; Chiquimula. British Honduras; Salvador; Honduras; southern Florida; West Indies.

A tall shrub or a tree, usually 5 meters high or less, the young branchlets glabrous or sparsely short-pilose; leaves opposite or subopposite, the rachis slender, not winged, glabrous or puberulent; leaflets 3 or 5, short-petiolulate, ovate-lanceolate to broadly ovate or rhombic-ovate, 2-7 cm. long, 1-4.5 cm. wide, acute or acuminate, cuneate to subtruncate at the base, crenulate or almost entire, usually glabrous; inflorescences terminal or axillary, paniculate; sepals ovate to triangular; petals narrowly obovate to oval, 2-3.5 mm. long; stigma sessile; drupe commonly globose, 5-8 mm. long, black at maturity and glaucous.

Called "Waika pine" in British Honduras; in Honduras variously called "chilillo," "pimienta," and "taray"; known as "torchwood" in Florida.

Amyris rhomboidea Standl. Carnegie Inst. Wash. Publ. 461: 65. 1935.

Known only from the type, collected on San Jacinto Hills, British Honduras, in forest, 270 meters, *Schipp* 1227.

A tree of 10 meters with a trunk 20 cm. in diameter, the branches grayish or whitish, the young branchlets puberulent or glabrate; leaves opposite, the slender rachis not winged; leaflets 5-7, rhombic-lanceolate or rhombic-ovate, 1.5-3 cm. long, 7-11 mm. wide, acute or acuminate with obtuse tip, obtuse and often slightly oblique at the base, short-petiolulate, glabrous and lustrous above, minutely puberulent or glabrate beneath, entire; flowers paniculate, the panicles sessile or short-pedunculate, about equaling the leaves, lax, many-flowered, the slender branches minutely puberulent, the pedicels 1-2 mm. long; calyx minute, dentate; petals white, 2 mm. long, obovate, rounded at the apex.

Amyris sylvatica Jacq. Sel. Stirp. Amer. 107. 1763. *Ciinche* (Maya).

Climax forest and secondary upland forest, Petén, little above sea level. Veracruz to Campeche and Yucatan; British Honduras; Honduras; Costa Rica; West Indies; northern South America.

A tall shrub or small tree, glabrous throughout or nearly so, the trunk usually 10 cm. or less in diameter; leaves mostly alternate, commonly 3-foliate, the slender rachis not winged; leaflets petiolulate, ovate or rhombic-ovate, rather thin, mostly 3-10 cm. long, acuminate to obtuse, broadly cuneate to rounded at the base, obscurely crenate or almost entire; flowers in terminal panicles; calyx glabrous, the sepals triangular or oval; petals white, oval to spatulate, 3 mm. long, rounded or subacute at the apex; style short, the stigma capitate; fruit globose or globose-pyriform, 5-7 mm. long, reddish or black.

Maya names of Yucatan are "tajcanyuc" and "canyuc"; the Spanish name is "palo de gas." The last name is derived from the fact that the white wood burns very easily (presumably when wet), with a bright flame. The inner bark is yellow. Formerly the wood of the related *A. balsamifera* L. was exported from Venezuela in large amounts to Germany and in small quantities to the United States for the production of an essential oil known as amyris oil or West Indian sandalwood oil.

CASIMIROA Llave & Lexarza

Large shrubs or trees; leaves alternate, deciduous or persistent, petiolate, digitately 1-several-foliate, the leaflets entire or obscurely crenate, pellucid-punctate, the lateral ones sessile or short-petiolulate; flowers small, whitish, perfect or sometimes with an abortive ovary; sepals 4-6, usually 5; petals generally 5; stamens as many as the petals, inserted on the base of the disk, the filaments subulate or linear-lanceolate, the anthers elliptic or oval; ovary 2-8-celled, com-

monly 4-5-celled, usually 5-lobate, the stigma 5-lobate or entire; ovules solitary in each cell; fruit resembling an apple, drupaceous, green or yellow, 2-5-celled, containing 2-5 large seeds, these oblong to obovate or oval.

Probably 6 species, all natives of Mexico and Central America. One other species, *C. Sapota* Oerst., grows in Mexico and was described from Nicaragua, but it has not been found in the intervening countries.

Leaflets glabrous.

Leaflets normally 5, acute or acuminate. *C. edulis*.

Leaflets 3, rounded or very obtuse at the apex. *C. emarginata*.

Leaflets densely velutinous-pilose beneath. *C. tetrameria*.

Casimiroa edulis Llave & Lex. Nov. Veg. Descr. 2: 9. 1825. *Matasano*; *Matasán*; *Ajachel* (Cacchiquel); *Ahache* (Poconchí).

Often cultivated in *fincas*, also growing wild or escaped from cultivation in many places, in wet to dry forest or thickets, often along roadsides, mostly at 600-2,700 meters; Alta Verapaz; Baja Verapaz; Zacapa; Chiquimula; El Progreso; Jalapa; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Quiché; Huehuetenango; Totonicapán; Quezaltenango; San Marcos. Widely distributed in Mexico; Salvador; Costa Rica.

A medium-sized or sometimes large tree with an often thick, pale trunk and a broad crown; leaves long-petiolate, the leaflets almost always 5, long-petiolulate, or sometimes short-petiolulate, elliptic to oval or broadly ovate, mostly 10-18 cm. long, acute or acuminate, acute to rounded at the base, thin or rather thick, entire or undulate; flowers fragrant, greenish yellow or whitish, the panicles mostly shorter than the petioles, the branches puberulent or glabrous; calyx small, the lobes acute or subacute; petals 3.5-4 mm. long; fruit variable in size and shape, usually green or pale yellow and resembling an apple, commonly 6-10 cm. broad.

The English name is "white sapote." The tree has been introduced into cultivation in southern Florida, and thrives there. This species has been reported from Guatemala under the name *Casimiroa Sapota* Oerst., but that species is not represented by any Guatemalan specimens we have seen, and may not be distinct from *C. edulis*. The local name, "matasano," appears in various geographic names, such as El Matasano, a *caserío* of Escuintla. The well-known town of Panajachel on Lake Atitlán signifies "place of the matasano," being derived from the Cacchiquel term for the tree. In Yucatan and many other parts of Mexico the tree is called "zapote blanco," a direct translation of the old Nahuatl name.

The fruit of the white sapote much resembles an early apple in shape, size, and coloring, also in texture and flavor of its flesh,

which is soft, cream-colored, of delicate texture, juicy, and with a pleasant sweet flavor. It is fairly good to eat, but is not highly esteemed in Guatemala or in Central America generally, and there is a popular belief that it is more or less "unhealthy." It is believed popularly that if eaten in considerable amounts, the fruit induces sleep. In Mexico there has been extracted from the plant a glucoside named casimiroisine, said to have a hypnotic and sedative effect. A small dose of it is reported to cause deep sleep lasting from four to six hours. When the fruits fall from the tree they are often crushed into a pulpy mass because of their weight and mellowness. They were noted as abundant in the market of Guatemala City in late April, many of the fruits having a gnarly or knobby appearance. The trees are abundant in many regions, as in the lower Motagua Valley and in Quezaltenango and San Marcos. Trees growing wild in wet forest in the region of Tactic, Alta Verapaz, looked somewhat different from the usual cultivated form, and may be specifically distinct, although possessing no obvious characters by which they can be distinguished in herbarium specimens.

Casimiroa emarginata Standl. & Steyer. Field Mus. Bot. 23: 165. 1944.

Known only from the type, San Marcos, growing near a house at Tajumulco (planted?), 2,300–2,800 meters, *Steyermark* 36931.

A tree 15 meters high, the branchlets stout, pale-lenticellate, glabrous or when young sparsely short-pilous, the axillary buds subglobose, very densely white-pilous and conspicuous because of their pale color; leaves long-petiolate, 3-foliate, the slender petioles 3–8 cm. long, glabrous, the petiolules 1–1.5 cm. long; leaflets membranaceous, elliptic or broadly elliptic, 7–10 cm. long, 4–7 cm. wide, rounded and shallowly emarginate at the apex or somewhat narrowed to a narrow emarginate tip, unequally rounded or very obtuse at the base, glabrous, deep green above, paler beneath; fruit (immature) in the dry state oval, 5–5.5 cm. high, 3.5–4 cm. broad, somewhat bilobate at the apex.

An imperfectly known tree of somewhat unsatisfactory status, but not easily associable with any of the species previously described from Mexico and Central America.

Casimiroa tetrameria Millsp. Field Mus. Bot. 1: 401. 1898. *Matasano*.

Moist or rather dry, wooded ravines and hillsides, 1,300–2,300 meters, often cultivated; Alta Verapaz; Jalapa; Guatemala; Huehuetenango. Southern Mexico, the type from Xcholac, Yucatan; British Honduras; Honduras; Costa Rica.

A tree, usually 9 meters high or less, the crown rounded, the branches thick and pale; leaflets usually 5, on long or short petiolules, oblong-ovate to elliptic, mostly 8–15 cm. long, acute or abruptly acuminate, acute or obtuse at the base, entire or obscurely crenate, green and often lustrous above, glabrous or nearly so, densely velutinous-pilose beneath and paler; flowers in axillary or lateral racemes or panicles mostly shorter than the petioles, the branches puberulent or pilose, the flowers slender-pedicellate, white or cream, the petals about 4 mm. long; fruit like that of *C. edulis*.

Called "matasano" in Central America. This species is abundant, apparently, in the Yucatan Peninsula and in some other parts of Mexico and Central America, but it appears to be scarce in Guatemala. The Maya name of Yucatan is "yuy." There is some possibility that this is only a variety of *C. edulis*, but generally the specimens or trees are immediately referable to one or the other species, and we have seen no intergrading forms.

CITRUS L.

Reference: Walter T. Swingle, The botany of *Citrus* and its wild relatives of the orange subfamily, in Webber & Batchelor, The Citrus Industry, 1: 129–474. *ill.* 1943.

Shrubs or small trees, often armed with spines, the younger branches usually green; leaves alternate, persistent, usually 1-foliate, pellucid-glandular, the petiole often winged; flowers perfect, axillary, solitary, fasciculate, or in small cymes, mostly white or purplish pink, fragrant; calyx cupular, 3–5-dentate; petals 4–8, somewhat fleshy, glandular, imbricate in bud; stamens 20–60, distinct or united, the filaments inserted around the annular or cupular disk; ovary several-celled, the styles united, deciduous; ovules several in each cell; fruit a globose or pyriform berry, with a leathery bitter rind containing numerous oil glands, the pulp juicy, aromatic; seeds usually several in each cell, the testa white, coriaceous.

A dozen species or more, natives of southeastern Asia and Malaysia, most of the species long in cultivation, hybridized, and difficult to arrange in a satisfactory taxonomic treatment. Besides the common citrus fruits listed below, other forms doubtless are in cultivation in Guatemala, at least experimentally or as curiosities.

Leaves 3-foliate.....*C. trifoliata*.

Leaves 1-foliate.

Leaves apparently not articulate between the blade and petiole; petiole not winged; flower buds tinged with red; fruit very large, with a very thick, spongy rind, the pulp scant, very acid.....*C. medica*.

Leaves evidently articulate between the blade and petiole; rind thin or only moderately thick.

Rind of the fruit easily separating from the pulp; leaflets lance-oblong, long-acuminate.....*C. nobilis*.

Rind of the fruit closely adherent to the pulp; leaflets broader, not long-acuminate.

Flower buds tinged with red outside; fruit oval, somewhat mammillate.

C. Limonia.

Flower buds white; fruit not mammillate.

Fruits oval, often slightly papillate, small or rather small, greenish yellow when ripe, thin-skinned, smooth; petioles conspicuously winged.

Fruit very acid. *C. aurantifolia.*

Fruit sweet or insipid, not sour. *C. Limetta.*

Fruit globose or depressed-globose, rarely oval or pyriform, never papillate, orange-colored or, if yellow, large and thick-skinned.

Fruits very large, pale yellow; petioles broadly winged. . . . *C. maxima.*

Fruits of medium or small size, orange or orange-yellow.

Fruit sweet, with a solid core; petioles slightly winged. . . *C. sinensis.*

Fruit acid, with a hollow core; petioles broadly winged.

C. Aurantium.

Citrus aurantifolia (Christm.) Swingle, Journ. Wash. Acad. Sci. 3: 465. 1913. *Limonia aurantifolia* Christm. Pflanzensyst. 1: 618. 1777. *C. Lima* Lunan, Hort. Jamaic. 1: 451. 1814. *Limón*; *Lamunx* (Quechí). *Lime*.

Cultivated commonly in the lowlands, mostly at 900 meters or less, but planted occasionally at higher elevations; naturalized in some localities in moist or wet thickets or coastal forest.

A small tree with irregular branches, armed with very sharp, stout, stiff spines; leaves mostly 5-7.5 cm. long, elliptic-oval, crenate; petioles narrowly but distinctly winged; flowers small, white in bud, in few-flowered axillary clusters; stamens 20-25; fruit small, 3-6 cm. long, with 10 segments, greenish yellow when ripe, the rind prominently gland-dotted, thin; pulp abundant, greenish, very acid; seeds small, oval, white within.

The lime is much used in Guatemala and all Central America, for the same purposes for which the lemon is used in the United States. Large quantities are offered in the markets, usually at low prices. However, the fruit is seasonal and during February, for instance, sometimes scarce. During that month limes were being offered in the Quezaltenango market at as much as five cents each, a truly fantastic price in Central America. Formerly much lime juice was bottled in the West Indies for use on shipboard as a preventive of scurvy. Lime juice is squeezed into soup and over meat and fish in Guatemala, and is used for making limeade. Many Guatemalans also still have a childlike faith in the value of lime juice as a sterilizing agent, being careful to use it freely in water whose wholesomeness is suspected. In this, it must be stated, they are joined by many equally ill-informed tourists from the United States, who believe that lime juice will kill all "germs." The Dirección de Agricultura estimates the number of lime trees of Guatemala at 39,000,

the chief producing departments being Escuintla, Santa Rosa, San Marcos, El Progreso, and Chiquimula. The tree is usually propagated from seeds.

Citrus Aurantium L. Sp. Pl. 782. 1753. *C. vulgaris* Risso, Ann. Mus. Hist. Nat. Paris 20: 190. 1813. *Naranja ácida*; *Arranz* (Quecchí). *Sour orange*.

Planted frequently in *fincas*, and in some lowland regions naturalized, as on the plains of Escuintla.

A medium-sized tree with rounded crown and regular branching, the spines long but rather flexible and not very sharp; leaves 7–10 cm. long, narrowed to the somewhat cuneate base, acute or acuminate, the petiole broadly winged; flowers medium-sized, axillary, solitary or fasciculate, white in bud; stamens 20–24; fruit 7–8 cm. in diameter, globose, slightly flattened at the apex; pulp acid, the membranes bitter, the segments 10–12; seeds cuneate-oval, white inside.

In Guatemala the sour orange often is used for flavoring meats and soups, or sometimes for making orangeade. This is the Seville orange, grown in large quantities in the vicinity of Sevilla, Spain, whence the fruit is shipped to England and Scotland for making orange marmalade. The petals yield oil of neroli, a valued perfume, produced principally in southern France and the Italian Riviera. The species is much used in the United States as a stock on which to graft the sweet orange.

Citrus Limetta Risso, Ann. Mus. Hist. Nat. Paris 20: 195. *pl.* 2. 1813. *Lima dulce*; *Lim* (Quecchí). *Sweet lime*.

Cultivated commonly in Guatemala in the lowlands, and sometimes at 1,200–1,800 meters; more common at low elevations.

Similar to *C. aurantifolia*, but often lower in growth, and frequently a large shrub, branching from the base; fruit about as large as a lemon, pale yellow, with a thin rind and abundant sweet insipid juice.

The sweet lime is a favorite fruit of Guatemala and of many other parts of Central America, and one likely to be offered to a visitor as a special mark of favor. Just why it should be so esteemed is hard to determine, for to the northern palate it seems the most insipid and least appetizing of the citrus fruits. The fruits usually are rather depressed-globose, and often mammillate at the apex. The Dirección de Agricultura estimates the number of trees in Guatemala at 7,400, many of them being in the departments of Jutiapa, Alta Verapaz, and San Marcos. There is sometimes planted in Guatemala a fruit known there as the “limalimón,” and the fruit is seen occasionally in the markets. Locally it is said to be a hybrid between the

sweet and sour limes. The fruit is 5 cm. or more in diameter, globose, very smooth, pale greenish yellow, and sweet. It has the odor of the lime but in flavor and appearance it is unlike either of its reputed parents.

Citrus Limonia Osbeck, Reise Ostind. China 250. 1765. *C. Limonum* Risso, Ann. Mus. Hist. Nat. Paris 20: 201. 1813. *Limón real*. *Lemon*.

Planted occasionally, but infrequent in Guatemala and all Central America.

A small tree with long irregular branches, the spines short, stout, stiff; leaves elongate-ovate, acute, obscurely serrate, the petioles not winged but sometimes narrowly marginate; flowers rather large, solitary or in small fascicles in the leaf axils, reddish-tinged in bud; petals white above, reddish purple below; stamens 20-40; fruit oval or oblong, mammillate at the apex, 7-12 cm. long, with 8-10 segments, lemon-yellow when ripe, the rind conspicuously gland-dotted, often rough and usually rather thick; pulp abundant, very acid; seeds small, ovate, often few or none, white inside.

The lemon is not liked in Central America because it is too sour, and its place in cookery and on the table is taken by the lime or sour orange. Lemons appear occasionally in the larger markets, as at Guatemala and Cobán, and handsome ones were seen in cultivation in Sacapulas (Quiché).

Citrus maxima (Burm.) Merrill, Interpret. Herb. Amboin. 296. 1917. *Aurantium maximum* Burm. ex Rumph. Herb. Amboin. Auct. Ind. Univ. 16. 1755. *C. grandis* Osbeck, Dagbok Ostind. Resa 98. 1757. *C. Aurantium* γ *grandis* L. Sp. Pl. 783. 1753. *Toronja*. *Grapefruit*.

Planted but rarely in Guatemala, but noted about Jalapa and at various places in the central region.

A large tree with rounded crown and regular branching, the spines slender and flexible, not very sharp, sometimes none; leaves large, oval or elliptic, acute, rounded at the base, the petiole broadly winged; flowers large, axillary, solitary or clustered, white in bud; stamens 20-25; fruit very large, usually 10-15 cm. in diameter, globose, depressed-globose, or broadly pyriform, smooth, with 11-14 segments, pale lemon-yellow when ripe, the rind thick; seeds usually numerous, white inside.

Central American people do not like the grapefruit because it is sour. It is sometimes offered in the larger Guatemalan markets, at least in that of Guatemala City, for sale principally to foreigners. It is, of course, one of the most popular breakfast fruits of the United States, being produced in vast quantities in Florida and

Texas. When in fruit this is the most spectacular of all the citrus trees, because of the great numbers of very large fruits which often are approximated in huge bunches near the ends of the branches. The Dirección de Agricultura estimates the number of Guatemalan trees at about 1,000. In Central America the fruit is perhaps better known by the English name "grapefruit" than the Spanish "toronja."

Citrus medica L. Sp. Pl. 782. 1753. *Cidra. Citron.*

Planted commonly in the warmer regions, and sometimes at middle elevations, but only in small numbers.

A shrub or small tree with long irregular branches, the spines short, stout, rigid; leaves rather pale green, obtuse or almost rounded at the apex, serrulate, the petioles not winged; flowers large, tinged with red in bud, in terminal panicles or fasciculate in the leaf axils, the large petals white above, reddish below; stamens 30-40 or more; fruit very large, oval or oblong, somewhat mammillate at the apex, 15-25 cm. long and 10-15 cm. broad, often rough, lemon-yellow when ripe, the rind very thick, fragrant, the scant pulp acid; seeds oval, smooth, white inside.

The citron is grown in large quantities in the Mediterranean region, especially on the island of Corsica, whence the peel is exported in brine to the United States and other regions, where it is candied. It is used chiefly for flavoring desserts and sweetmeats. The very thick rind is used in Guatemala for the same purposes, and candy made from it, greenish in color, often is offered for sale. It is employed also for flavoring *aguas gaseosas* (carbonated bottled beverages).

Citrus nobilis Lour. var. *deliciosa* (Tenore) Swingle in Sarg. Pl. Wilson. 2: 143. 1914. *C. deliciosa* Tenore, Ind. Sem. Hort. Neapol. 9. 1840. *Mandarina. Tangerine.*

Planted commonly at low and middle elevations, up to at least 1,500 meters.

A small tree with slender branches; leaves lanceolate, small, attenuate-acuminate, the petioles almost naked; flowers small, white; stamens 18-24; fruit small, depressed-globose, bright orange-yellow or reddish orange, with a very loose and easily separated rind; seeds usually green inside.

The tangerine is a favorite fruit in Guatemala and is produced in considerable numbers, although not one of the common or cheap fruits. Some of the fruits are too acid, others deliciously sweet. While the Guatemalan ones are mostly of normal size, some on sale at Quezaltenango in January were globose and scarcely more than 2.5 cm. in diameter. The fruit is employed in Guatemala for flavor-

ing *aguas gaseosas*. The typical form of the species, *C. nobilis* Lour., is the king orange, whose fruit is similar to that of the tangerine but much larger in size. The number of *mandarina* trees in Guatemala is estimated at 7,700, the leading departments being Quezaltenango, Suchitepéquez, Huehuetenango, and Escuintla.

Citrus sinensis (L.) Osbeck, Reise Ostind. China 250. 1765. *C. Aurantium* β *sinensis* L. Sp. Pl. 783. 1753. *Naranja dulce*; *Naranja*; *Chin* (Quecchí); *Lalancec* (Jacaltenango); *Pacal* (Maya). *Sweet orange*.

Planted abundantly at low and middle elevations, and up to 2,000 meters or more, a few trees, at least, doubtless to be found in every department.

A medium-sized tree with rounded crown and regular branching, the spines slender, flexible, often none; leaves medium-sized, acute or acutish, obtuse or rounded at the base, the petiole narrowly winged; flowers medium-sized, smaller than those of the sour orange, white in bud; stamens 20–25; fruit globose or oval, with sweet juice, the membranes not bitter, the segments 10–13; seeds white inside.

The orange must have been introduced into Guatemala soon after the conquest and has become one of the two or three most popular fruits of the country, produced in huge quantities and obtainable throughout the year at ridiculously cheap prices except during times of scarcity. According to statistics of the Dirección de Agricultura, the leading departments in production are Baja Verapaz, San Marcos, Alta Verapaz, Guatemala, Santa Rosa, Huehuetenango, Suchitepéquez, Escuintla, and Sacatepéquez. The number of trees in the country is estimated at 127,000. There is great rivalry among different localities as to which produces the best oranges, those having the highest reputation being the oranges of Rabinal (Baja Verapaz), grown mostly on irrigated land, and those of Colotenango in Huehuetenango. The best ones the senior author ever has tasted anywhere are those of Retalhuleu, probably grown in the vicinity, which are thin-skinned, very juicy, and sweet as honey. There are many local varieties, some that are ready to eat when the rind is still bright green. Most of the trees are seedlings, a fact responsible for much of the variation. All are of the variety called Seville in the United States. Navel oranges are seldom seen in Central America except in one region of Costa Rica, but a few trees exist in Guatemala, and the fruit is sometimes seen in the Guatemala market. It is usually larger than the Seville orange, more acid in flavor, with a thick rind that separates readily from the pulp. The

fruit bears at the apex an abortive small fruit that gives it its name of navel orange (*naranja de ombligo*).

In Guatemala as elsewhere the orange is a dessert fruit, esteemed by all people to whom it is available, and often a welcome substitute for water in regions where the quality of the water is suspected. Orange juice is a common morning appetizer in hotels and homes of the upper classes, and it is much used for preparing *aguas gaseosas* and other beverages.

Citrus trifoliata L. Sp. Pl. ed. 2. 1101. 1763. *Poncirus trifoliata* Raf. Sylva Tell. 143. 1838. *Limoncito*. *Trifoliate orange*.

Native of China. Rarely planted for ornament in the central region of Guatemala.

A shrub or small tree armed with long stout spines; leaves with 3 leaflets, the petiole slightly winged, the leaflets elliptic or obovate, sessile, 2-4 cm. long, subacute to rounded at the apex, cuneate to rounded at the base; flowers axillary, solitary or geminate, large, white; ovary 6-8-celled; fruit very fragrant, dull lemon-yellow, resembling a small orange, 3.5-5 cm. in diameter, covered with fine hairs, the pulp scant, very aromatic; seeds ovoid, very numerous.

In the United States this species is much used as a stock on which to graft other citrus fruits.

DECATROPIS Hooker f.

Small unarmed trees or shrubs; leaves alternate, odd-pinnate; flowers perfect, in terminal panicles; calyx cupular, short, 5-dentate; petals 5, inserted at the base of the disk; stamens 10, inserted on the base of the disk, those opposite the petals shorter, the filaments filiform; ovary 5-parted, 5-celled, sessile, the carpels sulcate dorsally, the edges wing-like; stigma 5-lobate; fruit of 5 or by abortion 2-3 distinct, reniform or lunate carpels, these narrowly winged dorsally; seeds solitary in each cell, the cotyledons elliptic, the embryo curved.

One other species is known, in southern Mexico.

Decatropis paucijuga (Donn. Smith) Loes. Bull. Herb. Boiss. II. 3: 208. 1903. *Polyaster paucijuga* Donn. Smith, Bot. Gaz. 27: 331. 1899. *Corazón bonito*.

Dry forest or thickets, 700-1,600 meters; endemic; Huehuetenango (type from Guaxacaná, Distrito de Nentón, *Seler* 3090).

Leaves large, pinnate, the leaflets 5-9, alternate or opposite, oblong-lanceolate or lanceolate, 7-13 cm. long, 2.5-5 cm. wide, acuminate, subacute to rounded and somewhat unequal at the base, glabrate above, densely yellowish-tomentose beneath, entire; panicles large, densely yellowish-tomentose; calyx 2-2.5 mm. broad, the teeth triangular; petals lanceolate or linear-lanceolate, 5 mm. long,

the apex acute, inflexed; filaments glabrous, the anthers orbicular; carpels tomentulose, the fruit 8–9 mm. broad.

The heartwood is blackish.

DECAZYX Pittier & Blake

Trees, the leaves large, simple, entire, punctate; flowers perfect, white, in long slender racemiform panicles; sepals 5, free, imbricate, persistent; petals 5, free, imbricate, deciduous; disk short, spreading, crenate; stamens 10, alternately unequal, united for half their length and deciduous as a ring, the filaments lance-subulate, the anthers short, dorsifixed; carpels of the ovary 5, coherent; style 1, short, thick, the stigma globose-ovoid; ovules 2 in each cell, superposed, subhorizontal; follicles by abortion usually 1–2, coriaceous, dehiscent by the ventral suture; seed solitary, the embryo with flat oval cotyledons, the endosperm thin, corneous.

A single species is known.

Decazyx macrophyllus Pittier & Blake, Contr. U. S. Nat. Herb. 24: 9. *pl. 3, f. 1–2*. 1922. *Mangle*.

Wet mixed forest, at or little above sea level; Izabal (between Escobas and Santo Tomás, *Steyermark* 39432). Honduras, the type from Los Ranchos, Dept. Copán, and collected also at Lake Yojoa, Dept. Comayagua.

A large tree, the branchlets strigillose; leaves on petioles 2.5–3.5 cm. long, cuneate-oblong, 18–28 cm. long, 5–9 cm. wide, rounded and abruptly short-pointed at the apex, long-attenuate to the base, pergamentaceous, glabrous, slightly paler beneath, somewhat lustrous above, the lateral nerves 18–28 pairs; panicles 18–27 cm. long, 2 cm. broad, strigillose, the pedicels 1.5–4.5 mm. long; sepals ovate, subobtusate, ciliolate, 1 mm. long; petals rhombic-cuneate, obtuse, 3.5 mm. long; stamens shorter than the petals, the filaments pilose; ovary pilose; ripe follicles broadly oval, erect, 4 mm. long, verrucose; seeds oblong-ellipsoid, 3 mm. long, fuscous brown, slightly lustrous.

The wood is used for construction.

ESENBECKIA HBK.

Unarmed trees or shrubs; leaves alternate, rarely opposite, simple or 1–5-foliolate, pellucid-punctate, the leaflets entire; flowers perfect, in terminal or axillary panicles; calyx 4–5-lobate or 4–5-parted, deciduous; petals 4–5, spreading, imbricate or subvalvate; disk annular or cupular, entire or 8–10-lobate; stamens 4–5, the filaments subulate, accumbent or immersed in the grooves of the disk, alternate with the petals, the anthers subcordate, mucronate; ovary depressed-globose, sessile or immersed in the disk, 4–5-lobate, 4–5-celled, often densely tuberculate; style basal, short, the stigmas capitate or 4–5-lobate; ovules 2 in each cell or sometimes 1, collateral; capsule subglobose, muricate, echinate, or coarsely rugose, splitting septically into 4–5 carpels, these loculicidally dehiscent, usually 1–

seeded; seeds without endosperm, enclosed in the elastic, corneous or chartaceous endocarp, this in drying separating, splitting, and curling back to eject the seed; testa cartilaginous; cotyledons large, unequal, the radicle short.

About 18 species, in tropical America.

Leaves 1-foliolate; capsule very densely covered with hard spine-like sharp-pointed processes.....*E. echinoidea*.

Leaves 3-5-foliolate; capsule merely rugose or with distant, very low and obtuse tubercles.

Leaflets glabrous beneath.....*E. pentaphylla*.

Leaflets pilose or hirsutulous beneath, often very densely velutinous-pilosulous.
E. litoralis.

Esenbeckia echinoidea Standl. & Steyer. Field Mus. Bot. 23: 164. 1944.

Dry rocky hillsides, rocky *quebradas*, or in dry lowland forest, 350-1,170 meters; endemic; El Progreso (Barranquillo); Zacapa (between Agua Blanca and Cumbre de Chiquimula); Chiquimula (type collected between Ramírez and Cumbre de Chiquimula, on the road to Zacapa, *Standley* 74456); Guatemala (Lago de Amatitlán).

A tree of 5-7 meters, the branchlets stout, densely whitish-strigose or glabrate; leaves 1-foliolate, the slender petiole 1.5-6 cm. long, sparsely strigose or glabrate; leaflets broadly elliptic, 9-28 cm. long, 4.5-15 cm. wide, obtuse or rounded at the apex, rounded or obtuse at the base, glabrous above or when young sparsely puberulent, slightly paler beneath, sparsely pilosulous or in age almost wholly glabrous, the nerves and veins prominent on both surfaces and rather closely reticulate; capsules 1-2, terminating a stout erect peduncle 5-6 cm. long, globose or depressed-globose, about 4 cm. broad and 2.5 cm. high, very hard and woody, densely covered throughout with thick hard acute hirtellous spines as much as 1 cm. long, these very unequal in length.

The fruit is very unlike that of other species of Central America and Mexico, the spines being so abundant that they almost wholly obscure the normal 5-angulate form of the capsule.

Esenbeckia litoralis Donn. Smith, Bot. Gaz. 23: 242. 1897.

Dry brushy rocky hillsides, 250-660 meters; Zacapa; Chiquimula. Salvador; Costa Rica; Panama.

A shrub or small tree, usually only 2-3 meters high, the branchlets stout, densely hispidulous; petioles 1-5 cm. long, hispidulous; leaflets normally 3, rather thick and firm, obovate to elliptic or oblong-oblancoate, 5-17 cm. long, 4-10 cm. wide, rounded to acute at the apex, acute to attenuate at the base, glabrous above or nearly so, densely or sparsely hispidulous beneath or densely and softly short-pilose, the venation conspicuous and closely reticulate on both surfaces; panicles terminal, racemiform, mostly 5-10 cm. long, densely hispidulous; flowers

5 mm. broad, subglomerate; sepals imbricate, hispidulous or glabrous, oval to suborbicular; petals pubescent or glabrous, 3 mm. long, obtuse, pellucid-glandular; capsule 5-angulate, about 2.5 cm. long and broad, glabrous, somewhat rugose and obscurely and obtusely short-tuberculate or almost smooth.

E. litoralis is closely related to *E. macrantha* Rose, which was published from Mexico later in the same year. The Guatemalan material seems to be better referable to *E. litoralis*, if that is a distinct species, and if the two are synonymous, *E. litoralis* has priority of publication.

Esenbeckia pentaphylla (Macfad.) Griseb. Fl. Brit. W. Ind. 135. 1859. *Galipea pentaphylla* Macfad. Fl. Jam. 1: 196. 1837. *E. Yaaxhokob* Lundell, Lloydia 4: 50. 1941. *E. belizensis* Lundell, Contr. Univ. Mich. Herb. 6: 33. 1941 (type from Middlesex, Stann Creek District, British Honduras, *P. H. Gentle* 2934).

In forest or open thickets, 800 meters or lower; Petén (Camp 32, British Honduras boundary, *W. A. Schipp* S643). Yucatan Peninsula of Mexico; British Honduras.

A tree as much as 25 meters high with a trunk 60 cm. in diameter, usually smaller, the branchlets puberulent or glabrate; leaves 3-5-foliolate, on long slender petioles; leaflets oblong to oblong-oval or obovate, 6-17 cm. long, 3-7 cm. wide, rounded to subacute at the apex, rounded to cuneate at the base, glabrous; flowers cream-colored, 6.5-8 mm. broad, in terminal many-flowered corymbiform panicles; sepals rounded-ovate or suborbicular, ciliolate, puberulent or glabrous; petals oblong to oblong-elliptic, 3-4 mm. long, rounded or obtuse at the apex; disk 3 mm. broad; capsule 4-5 cm. broad, shortly 5-rostrate at the apex, 5-angulate, rugulose and sometimes bearing a few short obtuse tubercles; seeds brown or blackish brown, deltoid-ovoid, somewhat compressed, 10-13 mm. long, 6.5-9 mm. broad.

The Maya names of Yucatan are reported as "yaaxhokob" and "hocab"; "verde lucero" (British Honduras). The wood is yellowish, fine-textured, very hard, heavy, and strong, suitable for tool handles and turned articles. No use is made of it locally unless for fuel.

GALIPEA Aublet

Shrubs or small trees; leaves alternate or opposite, 1-3-foliolate; flowers perfect; calyx cupular, 5-dentate or 5-parted; petals 5, hypogynous, alternate with the calyx lobes, united to the middle or higher, free above; stamens 5-8, adnate below to the corolla tube, 2 of them fertile, the filaments flat, broad, subulate above the middle, the anthers oblong; disk cupular, including or exceeding the ovary; ovary 5-lobate, 5-celled; ovules 2 in each cell, superposed; style filiform, the stigma 3-5-lobate; fruit capsular, 5-celled, the carpels united by their sides, at length separating, obtusely carinate dorsally, dehiscent only to the middle; seeds solitary in each carpel, with crustaceous testa.

About 10 species, in tropical America. One of them is found in Panama.

Galipea guatemalensis Standl. & Steyerl. Field Mus. Bot. 23: 165. 1944.

Dense wet mixed lowland forest, 150 meters or lower; endemic; Izabal (type from Río Dulce, between Livingston and 6 miles up the river, on the north side of the river, *Steyermark* 39448; also on Cerro San Gil).

A glabrous shrub or a tree as much as 7 meters high, the branches slender, irregular and crooked; leaves 1-foliolate, the petiole slender, 8–25 mm. long; leaflets firm-membranaceous, elliptic or oblong-elliptic, 10–20 cm. long, 4.5–8.5 cm. wide, abruptly cuspidate-acuminate, acute at the base, deep green and lustrous above, paler beneath, subundulate, the lateral nerves about 12 pairs, prominent beneath, the veins very slender, prominulous, laxly reticulate, the blades rather densely pellucid-punctate; peduncles 1 cm. long, apparently bearing a single capsule; carpels of the capsule soon separating, sessile, obliquely oblong, 2 cm. long, 8 mm. broad, gradually narrowed to the narrowly obtuse apex, rounded at the base, more or less rugose, glabrous; seeds scarcely compressed, blackish ferruginous, 1 cm. long, 4 mm. broad.

MEGASTIGMA Hooker f.

Unarmed pubescent shrubs with terete, often irregular, stout branches; leaves alternate, odd-pinnate, the leaflets small, membranaceous, opposite or subopposite, glandular-punctate, few-many pairs, short-petiolate; flowers small, perfect, paniculate or racemose; calyx small, 5-parted; petals 4, membranaceous, imbricate; disk thick, erect; stamens 8, inserted at the base of the disk, the alternate ones shorter, the filaments filiform; ovary didymous, 2-celled, the style short, thick; stigma large, capitate, obscurely 2-lobate; ovules 2 in each cell, collateral; fruit dry, didymous.

Two species are known, the other in southern Mexico.

Megastigma Skinneri Hook. f. in Benth. & Hook. Gen. Pl. 1: 299. 1862.

Type collected in Guatemala by Skinner, the locality unknown; sterile material from Chiquimula (Quebrada Shusho, above Chiquimula, 500 meters, *Standley* 74326) probably is referable here.

An unarmed shrub with fragrant foliage; leaves 3.6–5 cm. long, canescent-pilose, especially when young, green in age; leaflets usually 13–17, narrowly lanceolate to ovate, 8–15 mm. long, 2–7 mm. wide, entire or nearly so, short-petiolate, acute, at the base subacute or almost rounded, deep green above, slightly paler beneath, the venation rather prominent and laxly reticulate on both surfaces; panicles terminal, shorter than the leaves, trichotomously branched; flowers very small, the petals oblong, membranous, glandular-punctate; flowers slender-pedicellate; ovary glabrous, the lobes oblong.

We have seen no authentic material of this species. In recent Guatemalan collections it is represented only by a sterile but ample collection as cited above. This is clearly referable to *Megastigma* but it does not agree well with the brief description given by Wilson in *North American Flora*. In this Chiquimula collection the leaflets are numerous, as described for *M. Skinneri*, but in shape they are like those of the Mexican *M. Galeottii* Baill., being rhombic-oval or obovate and rounded or very obtuse at the apex. It may be that this sterile material represents a distinct species, but it is more probable that the shrub is a variable one, and that the Mexican and Guatemalan species recognized as distinct by previous authors are reducible to one.

MURRAYA L.

Unarmed shrubs or small trees; leaves alternate, odd-pinnate, the leaflets small, alternate or subopposite; flowers solitary or several together in terminal or axillary cymes; calyx 5-cleft; petals 4-5, imbricate or valvate; stamens 8-10, inserted on the disk, the filaments linear-ligulate, narrowed to the apex, the anthers small; gynophore present or obsolete; ovary 2-5-celled, the style elongate, deciduous, the stigma capitate; ovules solitary or 2 in each cell, superposed or collateral; fruit baccate, 1-2-celled or 5-celled; seeds 1-several, the testa lanate or glabrous; cotyledons plano-convex.

Four species, natives of the Indo-Malayan region.

Murraya paniculata (L.) Jack, Malay Miscel. 1: 31. 1820. *Chalcas paniculata* L. Mant. 1: 68. 1767. *M. exotica* L. Mant. 2: 563. 1771. *Limonaria*; *Mirto*; *Limoncillo*.

Planted frequently for ornament in gardens of the lowlands, and occasionally up to 1,500 meters in the central region. Native of southeastern Asia and Malaya.

A shrub or small tree with pale bark, the young branchlets usually puberulent; leaves dark green, the leaflets 3-9, ovate or rhombic-ovate, oval, or obovate, 1.5-5 cm. long, mostly obtuse, cuneate at the base, short-petiolulate, paler beneath; flowers white, fragrant; sepals triangular, obtuse, glabrous or puberulent; petals oblanceolate or obovate, 1-2.5 cm. long; ovary glabrous; fruit bright red, subglobose, 1-1.5 mm. long.

Sometimes called "jazmín de Arabia" in Salvador. The plant is esteemed for its sweet-scented flowers, and when covered with the red berries it is showy and handsome.

PELTOSTIGMA Walpers

Unarmed shrubs or small trees; leaves alternate, digitately compound, the leaflets entire or nearly so; sepals 3-4, unequal, the inner ones large and petal-

like, the outer ones smaller, herbaceous; petals 4-8, longer than the sepals, imbricate; disk thick, fleshy; stamens numerous, unequal, inserted on the disk, the filaments erect, subulate, the anthers oblong; ovary sessile, 6-10-carpellate, the carpels free above; styles 6-10, short; stigmas 6-10, large, connate; ovules 2 in each cell, superposed or collateral; capsule of 6-10 carpels, these rostrate at the apex; seeds 2 or by abortion 1 in each cell, with coriaceous testa.

One other species is known, in Mexico.

Peltostigma pteleoides (Hook.) Walp. Repert. Bot. 5: 387. 1846. *Pachystigma pteleoides* Hook. Icon. Pl. 7: pls. 698, 699. 1844. *Peltostigma pentaphyllum* Donn. Smith, Bot. Gaz. 19: 1. 1894 (type from Zamorora, Guatemala, Heyde & Lux 3058, 4437).

Wet or moist, mixed forest, 1,600-2,200 meters; Guatemala; Quezaltenango. Southern Mexico; Jamaica; Salvador; Costa Rica.

A shrub or small tree, in Costa Rica attaining a height of 12 meters and a trunk diameter of 30 cm. but usually smaller, glabrous throughout or nearly so, the bark pale grayish brown, smooth; leaves long-petiolate, the leaflets 3-5, long-petiolulate, obovate-oblong to elliptic-oblong or elliptic, 5-20 cm. long, acute or acuminate, usually attenuate and decurrent at the base, rather thick, entire or irregularly crenate; flowers borne on very long peduncles in the leaf axils, 3-5.5 cm. broad, cream-colored or pale yellow, fragrant; calyx deep green, the outer sepals ovate or oval, 4-5 mm. long, the inner ones orbicular; petals oval to sub-orbicular, 1.5-2.5 cm. long, densely puberulent outside; ovary velutinous-pilose; capsule subglobose, 2.5 cm. long.

Called "matasanillo" in Salvador. The large flowers are exceptionally handsome. The plant seemed to be very rare in Guatemala, and we have seen it only in the white-sand forest between Colomaba and San Martín Chile Verde, where it is plentiful locally, although not conspicuous.

RUTA L. Rue

Strong-scented perennial herbs, sometimes woody at the base; leaves alternate, glandular-punctate, often glaucous, simple to much divided; flowers perfect, yellow, in terminal, corymbose or paniculate cymes; sepals 4-5, persistent; petals 4-5, often dentate or laciniate, imbricate; disk thick, 8-10-lobate; stamens 8 or 10, inserted at the base of the disk; ovary 4-5-celled, sessile, more or less 4-5-lobate, the style central, with a small stigma; ovules several in each cell; fruit capsular, 4-5-celled, 4-5-lobate; seeds angulate, with carnosous endosperm; embryo slightly curved, the cotyledons sometimes 2-parted.

About 40 species, natives of the Old World.

Ruta chalepensis L. Mant. 1: 69. 1767. *Ruda*; *Ru* (Huehuetenango, fide Tejada); *Rurá* (Quiché); *Rorá* (Totonicapán).

Native of the Mediterranean region. Cultivated commonly in gardens of Guatemala, as in Central America generally, chiefly for use in domestic medicine.

A glabrous glaucous perennial herb, sometimes a meter high but usually lower; leaves 2-3 times pinnately parted, the segments linear to oblong or obovate, rounded or emarginate at the apex, entire or lobate; flowers greenish yellow, in terminal corymbs; sepals ovate, crenulate, 3.5-4 mm. long; petals lacinate, 7.5-9 mm. long; capsule ovoid, 7-9 mm. broad, the lobes acute.

Almost every Guatemalan garden, at least in the uplands, has a few plants of rue, to be used in everyday medicine. The plant is bitter and acrid, these properties lying in an oil contained in the foliage. In Guatemala it is used to induce menstruation and for other purposes, but its use may cause fatal results. It was used medicinally in Europe in very ancient times, but it is not employed in modern medical practice. The plant does not flower freely, and many people state that it never flowers in Central America but, as a matter of fact, flowers are not infrequent. In some parts of Honduras there is a popular belief that the plant blooms only at midnight, when the devil gathers the blossoms, giving them only to some person who will make a compact with him, so that the person may use them in whatever difficulty he may find himself.

TRIPHASIA Loureiro

Shrubs, armed with spines; leaves persistent, alternate, 3-foliolate, or sometimes with only 1-2 leaflets; flowers perfect, solitary or in axillary cymes; calyx cupular, 3-4-lobate; petals 3-4, imbricate; stamens 6, inserted on a fleshy disk, the filaments compressed, dilated toward the base, the anthers oblong; ovary obovate, 3-4-celled, narrowed to a deciduous style, the stigma obtuse or capitate, 3-4-lobate; ovules solitary in each cell; fruit baccate, 1-3-seeded; seeds oval or subglobose, with fleshy testa; cotyledons plano-convex, unequal, sometimes lobate, the embryo straight.

A single species.

Triphasia trifolia (Burm. f.) P. Wilson, *Torreyia* 9: 33. 1909. *Limonia trifolia* Burm. f. *Fl. Ind.* 103. 1768. *L. trifoliata* L. Mant. 2: 237. 1771. *T. trifoliata* DC. *Prodr.* 1: 536. 1824. *Limoncillo*.

Native of southeastern Asia. Planted occasionally for ornament in gardens of Guatemala, especially in the central region.

Usually a shrub of about 2 meters, the young branches puberulent, the spines axillary in pairs, straight; leaflets ovate or oval, 1-3.5 cm. long, obtuse or rounded and often emarginate at the apex, cuneate or rounded at the base, crenate, glabrous; flowers white, fragrant, the calyx puberulent, its lobes broadly triangular, ciliate; petals oblong, 12-16 mm. long; fruits oval or globose, red, 1-1.5 cm. long, punctate, aromatic.

ZANTHOXYLUM L.

Shrubs or trees, often armed with prickles on the branches and trunks, the bark aromatic; leaves alternate, even-pinnate, odd-pinnate, 3-foliate, or 1-foliate, the leaflets opposite or alternate, entire or crenate, glandular, the rachis often winged; flowers white or whitish, small, dioecious or polygamous, the inflorescences terminal or axillary; calyx hypogynous, sometimes none, the sepals 3-5, usually more or less united; petals 3-10; stamens 3-5, hypogynous, alternate with the petals, rudimentary or absent in the pistillate flowers; filaments filiform or subulate, the anthers elliptic to suborbicular; pistils 1-5, on an elevated fleshy gynophore, sometimes slightly united below; carpels 1-celled, the styles short, slender, more or less united above, the stigmas capitate; ovules 2 in each cell, collateral, pendulous from the inner angle of the cell; fruit of 1-5 follicles, the endocarp free; seeds oblong to globose, suspended on slender funicles, hanging from the carpel at maturity, the testa black or reddish, lustrous; embryo straight or curved, the cotyledons oval or orbicular, foliaceous.

Probably 160 species or more, in the tropics of both hemispheres. A few additional species occur in other parts of Central America. The generic name is often written *Xanthoxylon* or *Xanthoxylum*.

Leaflets 3 *Z. Limoncello*.

Leaflets 5 or more, often numerous.

Leaflets, at least the lateral ones, obtuse or rounded at the apex, small, all or most of them 1.5-4 cm. long.

Rachis of the leaf armed with short recurved prickles.

Leaflets 13 mm. long or shorter, crenate *Z. foliolosum*.

Leaflets mostly 15-40 mm. long, entire or serrulate.

Leaflets 17-21, 17-20 mm. long *Z. nubium*.

Leaflets 5-11, mostly 20-40 cm. long *Z. Harmsianum*.

Rachis of the leaf unarmed.

Capsule densely echinate *Z. Aguilarii*.

Capsule unarmed *Z. Culantrillo*.

Leaflets all conspicuously acute or acuminate, often abruptly so, large, mostly 5-15 cm. long, sometimes rather small but the inflorescence then with corky-thickened branches.

Flowers densely crowded in the leaf axils, the inflorescences shorter than the broadly winged petioles *Z. quassiaefolia*.

Flowers paniculate, the panicles usually large and open; petioles not winged.

Branches of the panicle corky-thickened.

Leaflets long-acuminate, acute at the base, oblong-lanceolate. *Z. Genilei*.

Leaflets acute or obtuse, rounded or obtuse at the base, mostly ovate to oval or elliptic *Z. caribaeum*.

Branches of the panicle not corky-thickened.

Pubescence of the young branchlets and leaves of stellate hairs.

Leaflets mostly 1.5-2.5 cm. wide, conspicuously crenate.

Z. microcarpum.

Leaflets mostly 2.5-5 cm. wide, entire or nearly so *Z. belizense*.

Pubescence of simple hairs or none.

Sepals 3

Z. procerrum.

Sepals 4-5.

Panicles short, usually much less than half as long as the leaves; leaflets usually rounded or very obtuse at the base, coriaceous.

Z. Kellermanii.

Panicles large, often almost as long as the leaves; leaflets acute at the base, relatively thin

Z. mayanum.

Zanthoxylum Aguilarii* Standl. & Steyerl. Field Mus. Bot. 22: 146. 1940. *Uña de gato; Lagarto; Caulotillo.

Moist or damp forest or ravines, sometimes in dry hillside thickets, 400-2,300 meters; endemic; Baja Verapaz; Santa Rosa; Chiquimula; Escuintla; Guatemala; Sacatepéquez (type from *barranco* above Dueñas, *Standley* 63209); Chimaltenango; Sololá; Huehuetenango.

A shrub or a small tree, sometimes 9 meters high, the branches unarmed or bearing few short straight prickles, the young branchlets puberulent or lepidote or glabrous; leaves odd-pinnate, the rachis narrowly winged; leaflets usually 9-13, sessile, subcoriaceous, oblong to lance-oblong or subelliptic, 2.5-5.5 cm. long, 1-1.5 cm. wide, rounded to obtuse or subemarginate at the apex, rarely subacute, obtuse at the base, often remotely and rather coarsely crenate, sometimes almost entire, glabrous above, beneath sparsely brown-punctate, puberulent or pilosulous especially along the costa, or almost wholly glabrous; inflorescences mostly axillary, small, paniculate, half as long as the leaves or shorter, densely many-flowered, sessile or short-pedunculate, the branches thick, sparsely puberulent; flowers 4-parted, green, mostly sessile and densely aggregate; sepals minute, rounded-ovate, obtuse; petals 2 mm. long, glabrous, ciliolate; follicle 1, globose, 1 cm. broad, everywhere very densely covered with rather long, hard, sharp spines; seeds black, lustrous, 3.5-4 mm. long, smooth.

A very distinct species because of the densely spiny fruit. It was named for Don José Ignacio Aguilar, Director of the Finca Nacional La Aurora.

Zanthoxylum belizense* Lundell, Contr. Univ. Mich. Herb. 6: 35. 1941. *Cedro.

Wet forest or thickets, little above sea level; Izabal. British Honduras, the type from Manatee, Belize District, along creek in high ridge, *P. H. Gentle* 3431; Oaxaca; Veracruz; Nicaragua.

A tree sometimes 20 meters high, the trunk 25-60 cm. in diameter, armed with hard conic prickles 3-5 cm. long, often buttressed, the bark light or medium brown to grayish; branchlets unarmed or bearing broad-based sharp prickles, when young stellate-puberulent; leaves odd-pinnate, the rachis naked, stellate-puberulent; leaflets 7-21, sessile, short-petiolulate, membranaceous, oblong or lance-oblong, mostly 6-15 cm. long and 3-6 cm. wide, obscurely crenulate, gradually or abruptly acuminate, obliquely rounded at the base, glabrate above, stellate-pubescent

beneath, when young often densely so, in age glabrate; panicles stellate-puberulent, 15 cm. long or shorter; sepals 5, 0.5 mm. long; follicles usually solitary, about 5 mm. long, sessile.

Called "prickly yellow" in British Honduras, and "tachuelilla" in Oaxaca. Sapwood bright or light yellow when freshly cut, darkening on exposure, the heartwood grayish brown, slightly fragrant when fresh, easy to cut and split. The wood is said to be used in Oaxaca for furniture and construction. The leaf rachis and the costa on the under leaf surface often are provided with a few large prickles, at least on vigorous sterile branches.

Zanthoxylum caribaeum Lam. *Encycl.* 2: 39. 1786. *Fagara caribaea* Krug & Urban in Urban, *Bot. Jahrb.* 21: 562. 1896. *Z. occidentale* Rose, *Contr. U. S. Nat. Herb.* 5: 164. 1899.

Moist or wet, mixed forest, 300 meters or less; Alta Verapaz; Huehuetenango. British Honduras, in thickets near sea level, sometimes in second growth, probably extending into Petén and perhaps into Izabal. Southern Mexico; Honduras; West Indies; northern South America.

A shrub or a small tree, sometimes 9 meters high or probably even larger, the branches glabrous, armed with stout, straight, dark brown prickles; leaves odd-pinnate or even-pinnate, the rachis marginate; leaflets mostly 7-13, short-petiolulate, membranaceous, ovate to elliptic or oval, mostly 4.5-10 cm. long, obtuse or short-acuminate, rounded to subacute at the base, commonly rather coarsely crenate, glabrous; inflorescence usually terminal, 4-20 cm. long, the branches conspicuously corky-thickened, the flowers 5-parted; sepals suborbicular, 1 mm. long or shorter; petals 4-5 mm. long; carpels of the ovary 5; follicles 4.5-8 mm. long, rugose, short-stipitate; seeds 4-5 mm. long.

Called "bastard prickly yellow" in British Honduras; the Maya name of Yucatan is "sinanche," "scorpion tree." Called "duermelengua" in Honduras, where the bark and branches are said to be chewed as a remedy for toothache.

Zanthoxylum Culantrillo HBK. *Nov. Gen. & Sp.* 6: 2. 1823. *Guachimol*; *Uña de gato*.

Dry, brushy, often rocky hillsides, 600-1,500 meters; El Progreso; Chiquimula; Jalapa; Jutiapa; Santa Rosa. Honduras; Salvador; South America, southward to Peru.

A shrub or small tree, the branchlets hirsutulous or glabrous, usually armed with stout recurved prickles; leaves small, odd-pinnate, the petiole and rachis narrowly winged; leaflets usually 5 or 7, oblong-ovate to obovate, mostly 1-3.5 cm. long, coarsely crenate to subentire, rounded or very obtuse at the apex, often emarginate, cuneate at the base, pale green or yellowish green when dried, glabrous;

inflorescences axillary and subterminal, racemose or narrowly paniculate, shorter than the leaves; sepals 4, ciliate; follicles ellipsoid or subglobose, 3.5–4 mm. long, tuberculate-glandular; seeds subglobose, 2.5–3 mm. in diameter, black, shining.

Known in Salvador by the names "salitrero," "culantrillo," and "cedro espino." It is rather remarkable that the closely related and widely distributed *Z. Fagara* (L.) Sarg. has not been collected in Guatemala, but we have seen no specimens. It differs in having the flowers clustered in the leaf axils or in short spikes scarcely 1 cm. long.

Zanthoxylum foliolosum Donn. Smith, Bot. Gaz. 18: 1. 1893. *Z. suaveolens* Lundell, Amer. Midl. Nat. 20: 237. 1938 (type from Montecristo, Chiapas, Matuda 1933). *Fagara foliolosa* Engler in Engl. & Prantl, Pflanzenfam. 3, pt. 4: 118. 1896. *Uña de gato*; *Uña de ardilla*; *Locba-eteh* (Huehuetenango).

Wet or moist forest or thickets, 1,600–2,400 meters; Baja Vera-paz (near Santa Rosa); El Progreso; Jalapa; Sacatepéquez (type from San Rafael, J. D. Smith 1319); Quiché; Huehuetenango; San Marcos. Chiapas.

A weak shrub 2–3 meters high, or often a rather large vine, the branches ferruginous, armed with short stout recurved prickles; leaves small, odd-pinnate, the rachis scarcely marginate, armed with small recurved prickles; leaflets 15–31, sessile, broadly oblong or oval, mostly 8–12 mm. long, broadly rounded at the apex, truncate and 2-glandular at the base, subcoriaceous, crenate, glabrous; panicles lateral, lax and rather few-flowered, glabrous or puberulent, shorter than the leaves, the flowers 4-parted, pedicellate; petals broad, greenish white, glabrous, 2 mm. long; follicles 1–2, turning bright red, globose, 5–7 mm. long, glandular-verrucose; seeds 4 mm. long, black, lustrous.

This plant is a great pest where it grows abundantly, forming almost impenetrable tangles, the prickles grasping and tearing the clothing and flesh.

Zanthoxylum Gentlei Lundell, Lloydia 2: 92. 1939. *Prickly yellow*.

Known only from the type, P. H. Gentle 2652, collected in broken ridge, Stann Creek–Mullins River road, Stann Creek District, British Honduras.

A tree with a trunk 25 cm. in diameter, unarmed so far as the specimens show, glabrous or nearly so; leaves large, the rachis naked; leaflets 9–15, short-petiolulate, firm-membranaceous, lance-oblong, 5–10 cm. long, 1.5–3 cm. wide, long-acuminate, acute at the base and unequal, rather coarsely appressed-crenate; inflorescences lateral and terminal, 9 cm. long or less in fruit, the branches very stout and corky-thickened; sepals 5; follicles 1–5, obovoid, 5–6 mm. long, on rather long, thick stipes, glandular; seeds black, very lustrous, 4–5 mm. long.

Closely related to *Z. caribaeum* and quite possibly only a form of that species.

Zanthoxylum Harmsianum (Loes.) P. Wilson, Bull. Torrey Club 37: 86. 1910. *Fagara Harmsiana* Loes. Bull. Herb. Boiss. II. 3: 96. 1903. *Uña de gato*; *Shuca-e* (Huehuetenango).

Moist or wet forest, often in *Cupressus* forest, 1,500–3,400 meters; Alta Verapaz; El Progreso; Chimaltenango (type from Sierra Santa Elena near Tecpám, *Seler* 2343); Sololá; Huehuetenango; Quezaltenango; San Marcos. Chiapas.

An erect shrub or small tree, sometimes 6 meters high, often elongate and scandent, the branches armed with stout recurved prickles, smaller prickles present on the petioles and leaf rachis, the plants glabrous throughout or nearly so; leaves odd-pinnate, the rachis not winged; leaflets coriaceous, 5–11, sessile or nearly so, broadly ovate to oval, mostly 2–4 cm. long, usually very obtuse at the apex, sometimes obtuse-acuminate, rounded or obtuse at the base, usually inconspicuously serrulate; panicles lateral, usually much shorter than the leaves and rather few-flowered, minutely puberulent or glabrous, the flowers 4-parted, pedicellate, greenish; sepals scarcely 1 mm. long, obtuse or rounded; petals 2–2.5 mm. long; follicles usually 2 and 5–7 mm. long, coarsely glandular, subglobose; seeds black, lustrous.

The shrub is very common in the dense *Cupressus* forest about the type locality, one of the most beautiful stands of coniferous forest in Guatemala.

Zanthoxylum Kellermanii P. Wilson, N. Amer. Fl. 25: 195. 1911. *Fagara Kellermanii* Engler in Engl. & Prantl, Pflanzenfam. ed. 2. 19a: 220. 1931. *Lagarto*.

Wet forest at or little above sea level, or sometimes at higher elevations; Petén; Izabal (type from Los Amates, 90 meters, *W. A. Kellerman* 7109); Quiché. British Honduras; Honduras; Salvador.

A tall tree, often 30 meters tall, the trunk 1 meter in diameter or less, usually buttressed, covered with large conic prickles, the branches armed with short prickles; leaves large, unarmed, even-pinnate, the leaflets short-petiolulate, usually coriaceous, generally 6–8, oblong to elliptic, mostly 10–14 cm. long and 4.5–6 cm. wide, abruptly short-acuminate, usually rounded and unequal at the base, glabrous, entire or nearly so, lustrous above, paler and brownish beneath; panicles lateral, about 10 cm. long, the stout branches minutely strigose; sepals 5; follicles 2–3, sessile, subglobose, united below, 5–6 mm. long, strigillose; seeds 4–4.5 mm. broad, black, lustrous.

Called “prickly yellow” in British Honduras; in Honduras “cedro espino” and “lagarto amarillo.” The crushed leaves have a lemon-like odor. The wood is pale yellow, moderately hard, fairly straight-

grained, coarse-textured, easy to work, finishes smoothly, is not very durable; suitable for general carpentry.

Zanthoxylum Limoncello Planch. & Oerst. in Triana & Planch. Ann. Sci. Nat. V. 14: 312. 1872. *Fagara Limoncello* Engler in Engl. & Prantl, Pflanzenfam. 3, pt. 4: 117. 1896. *Culantrillo*.

Dry rocky thickets or in rather dry forest, 900–1,500 meters; Baja Verapaz; Chiquimula; Jalapa; Jutiapa; Guatemala (Fiscal); Huehuetenango. Southern Mexico; Costa Rica; Panama (type from Volcán de Chiriquí).

A shrub or small tree 2–7 meters high, glabrous throughout, the branches slender, armed with small prickles; leaves small, 3-foliate or rarely 5-foliate, the petioles not winged; leaflets petiolulate, oblong-elliptic or lance-elliptic, 3–7 cm. long, acuminate to obtuse, cuneate at the base, crenulate or almost entire, often yellowish green when dried; panicles axillary and terminal, minutely puberulent or glabrate, short and dense, mostly shorter than the petioles, the flowers 4-parted; petals 1.2–2 mm. long; follicles globose, 4.5–6 mm. long, short-stipitate, glandular-verrucose; seeds subglobose, 3–3.5 mm. in diameter, black, lustrous.

All parts of the plant have a strong odor, somewhat suggestive of lemon, or perhaps more accurately of bedbugs, and often highly disagreeable. The specific name is a corruption of the Spanish "limoncillo."

Zanthoxylum mayanum Standl. Field Mus. Bot. 8: 140. 1930 (type from Honey Camp, British Honduras, *Lundell* 672). *Z. nigripunctatum* Lundell, Bull. Torrey Club 64: 551. 1937 (type collected in advanced forest south of Cohune Ridge, El Cayo District, British Honduras, *Lundell* 6487).

British Honduras and Chiapas; doubtless extending into Petén.

A medium-sized or tall tree, sometimes 25 meters high with a trunk 40 cm. in diameter, said to be unarmed, the young branchlets somewhat puberulent; leaves large, even-pinnate or odd-pinnate, the rachis not winged; leaflets mostly 6–9, oblong-lanceolate to obovate-oblong, mostly 5–10 cm. long, acuminate to long-acuminate, attenuate to acute at the base, obscurely crenulate, often blackish when dried, lustrous above, very sparsely puberulent beneath when young or almost completely glabrous; panicles terminal or axillary, 10 cm. long or less, often many-flowered and much branched, the flowers 5-parted; petals whitish, 2.5–3 mm. long, glabrous; follicles usually 2, united below, ellipsoid-globose, 4 mm. long.

Called "prickly yellow" in British Honduras. One British Honduras specimen has been reported as *Z. trichilioides* Standl., a species not known to extend so far southward. The status of *Z. mayanum* is at present decidedly uncertain; possibly it will have to be united with one of the Mexican species.

Zanthoxylum microcarpum Griseb. Fl. Brit. W. Ind. 138. 1859. *Fagara microcarpa* Krug & Urban, Bot. Jahrb. 21: 570. 1896. *Cola de lagarto*; *Lagartillo*; *Ceibillo*; *Palo de lagarto*; *Brasil*.

Moist or dry forest or thickets, 1,600 meters or lower; Izabal; Santa Rosa; Escuintla; Guatemala; Suchitepéquez; Quezaltenango; San Marcos; Huehuetenango. Honduras; Costa Rica; Lesser Antilles to Brazil.

A small to large tree, sometimes 22 meters high with a trunk 45 cm. in diameter but usually much smaller, the bark light gray, covered with pyramidal corky prickles, the branchlets mostly unarmed, stellate-tomentulose when young; leaves large, even-pinnate or odd-pinnate, the rachis not winged, often armed with straight prickles; leaflets 11–30, oblong or oblong-lanceolate, 3–9 cm. long, 1–2.5 cm. wide, firm-membranaceous, acute or acuminate, acute or obtuse at the base and almost sessile, serrate-crenate, often coarsely so, green and glabrate above, paler beneath and sparsely or densely stellate-puberulent; panicles terminal, mostly 10–15 cm. long, much branched, the flowers whitish, 5-parted, the branches stellate-puberulent; sepals 0.2–0.3 mm. long; petals 1.5–2 mm. long; follicles 1–2, subglobose, 4–5 mm. in diameter, glandular-verrucose; seeds compressed, 2.5–3 mm. broad, black, lustrous.

The foliage has a strong and characteristic odor. Called “cedro espino” in Salvador and “chinchillo” and “coroncho de lagarto” in Honduras. The wood is yellow.

Zanthoxylum nubium Standl. & Steyer. Field Mus. Bot. 22: 243. 1940.

Known only from the type, collected in wet forest, summit of Volcán de Quezaltepeque, Chiquimula, 2,000 meters, *Steyermark* 31430.

A glabrous scandent shrub, the slender branches armed with small recurved prickles; leaves small, odd-pinnate, the rachis not winged, armed with small recurved prickles; leaflets 17–21, sessile, entire, oval or oblong-oval, 17–22 mm. long, 8–11 mm. wide, obtuse, rounded and sometimes unequal at the base, 2-glandular beneath at the base, coriaceous; panicles lateral and axillary, about 5 cm. long, lax, few-flowered, the pedicels 12 mm. long or less; sepals 4; follicles usually 2, subglobose, 5 mm. long, glandular-verrucose, rounded at the apex.

This is closely related to *Z. Harmsianum*, and possibly it can not be maintained as distinct. The leaflets are smaller and more numerous than in that species.

Zanthoxylum procerum Donn. Smith, Bot. Gaz. 23: 4. 1897. *Ceibillo*; *Lagarto*; *Limoncillo*; *Naranjillo*; *Choonte*, *Kixche* (Petén, Maya).

Moist or wet forest or thickets, 2,600 meters or less; Petén; Alta Verapaz; Izabal; El Progreso; Zacapa; Chiquimula(?); Huehuet-

nango; Quezaltenango; San Marcos. Southern Mexico; British Honduras; Honduras; Costa Rica.

A small to rather large tree, sometimes 15 meters high, the trunk covered with short conic prickles, glabrous throughout or nearly so, the younger branches unarmed or bearing a few short prickles; leaves even-pinnate or odd-pinnate, large, unarmed; leaflets 4-12, opposite, petiolulate, oblong to elliptic, mostly 7-15 cm. long and 2.5-5 cm. wide, thick-chartaceous or subcoriaceous, acuminate, often abruptly so, very acute to rounded at the base, deep green above and often lustrous, somewhat paler beneath, usually entire or essentially so; inflorescence terminal, corymbiform, many-flowered, often much branched, dense or rather lax, the flowers yellowish white, 3-parted, mostly pedicellate; petals 1.5-2.5 mm. long, obtuse; follicle 1, glandular, 5.5-7 mm. long; seeds ellipsoid or globose, 4-4.5 mm. long, black, lustrous.

The sapwood is yellowish white, the heartwood dark yellowish brown, the bark yellowish brown. Called "black prickly yellow" in British Honduras. The name "lagarto" given to this and other species refers to the low pyramidal corky prickles that often thickly cover the trunks, giving them somewhat the appearance of alligator skin. In this as in other species the numerous oil glands of the foliage give the plant a strong and distinctive odor.

Zanthoxylum quassiaefolia (Donn. Smith) Standl. & Steyer-
erm., comb. nov. *Rigiostachys quassiaefolia* Donn. Smith, Bot.
Gaz. 54: 235. 1912. *Z. citroides* Standl. Field Mus. Bot. 22: 85.
1940 (type from Volcán de Tacaná, Chiapas, *E. Matuda* 2961).
Fagara quassiaefolia Monachino & Cronquist, Brittonia 5: 131. 1944.

In thickets or mixed forest, 1,000-2,100 meters; Baja Verapaz (type from Panzal, *Tuerckheim* II.1714); sterile material from Huehuetenango (collected near Ixcán) probably is referable here; doubtless occurring in San Marcos. Chiapas.

Branches apparently unarmed, glabrous; leaves glabrous, 3-5-foliolate, the petioles 2.5-3 cm. long, broadly winged, the wing 6-8 mm. wide, the rachis broadly winged and as much as 1 cm. wide; leaflets membranaceous, elliptic-oblong to lanceolate, 8-14 cm. long and 3-5 cm. wide or smaller, acuminate at each end, sparsely pellucid-punctate with large glands, minutely crenulate or almost entire; flowers small, densely clustered in the leaf axils or at defoliate nodes, sessile or subsessile, 3-parted; sepals rounded, 0.8 mm. long; petals 2-3.5 mm. long, rounded at the apex.

SIMAROUBACEAE. Quassia Family

Shrubs or trees, often with very bitter bark; leaves alternate or rarely opposite, pinnate, rarely 1-3-foliolate or simple, not punctate; stipules usually none; flowers dioecious or polygamous, sometimes perfect, regular, the inflorescences generally axillary, paniculate or racemose, sometimes spicate or the flowers solitary, the flowers usually small; calyx with 3-5 lobes or segments; petals 3-5, rarely none,

imbricate or valvate; disk annular, cupular, or elongate to form a gynophore, entire or lobate; stamens inserted at the base of the disk, as many as the petals or twice as many, the filaments free, naked, pilose, or with a basal scale; anthers oblong, 2-celled, mostly introrse, longitudinally dehiscent; ovary usually deeply 2-5-lobate, rarely entire, 1-5-celled or of 3-5 free carpels; styles 2-5, free at the base and apex or at the base only, or the stigmas capitellate and connate; ovules mostly solitary, sometimes geminate, affixed to the internal angle of the cell, anatropous; fruit drupaceous, capsular, or samaroid, sometimes of 1-6 dry or fleshy carpels, these usually indehiscent; seeds generally solitary, pendulous, the testa membranaceous; endosperm abundant and carnose or scant or none; embryo straight or curved, the cotyledons usually plano-convex or plane, the radicle superior.

About 30 genera, in the tropics of both hemispheres. The only other genus native in Central America is *Simaba*, which may possibly grow in the Pacific coast of Guatemala.

Leaves simple.....*Suriana*.

Leaves pinnate.

Leaf rachis conspicuously winged or marginate.....*Quassia*.

Leaf rachis not at all winged.

Fruit dry, samara-like, densely pubescent and ciliate.....*Alvaradoa*.

Fruit a juicy drupe or berry, usually glabrous, at least at maturity.

Carpels of the ovary 1-ovulate, distinct; leaflets pale or glaucous beneath.
Simarouba.

Carpels of the ovary 2-ovulate, united; leaflets green beneath..*Picramnia*.

ALVARADOA Liebmann

Shrubs or trees with slender branches; leaves alternate, mostly rather crowded near the ends of the branches, odd-pinnate, the leaflets small and numerous; flowers dioecious, in dense racemes, these often pendent, with inconspicuous bracts; sepals 5, short, slightly united at the base; petals none; stamens 5, long-exserted, the filaments filiform, pubescent, the anthers small, subglobose; ovary 2-3-celled, sessile; styles 2-3, recurved, the stigmas minute; ovules 2 in each cell; fruit samaroid, small, short or elongate, 2-3-winged.

Five species, 3 in the West Indies, one in Bolivia and Argentina. The genus was named for Pedro de Alvarado, companion of Cortés and conqueror of Guatemala and Salvador.

Alvaradoa amorphoides Liebm. Nat. For. Kjoebenhavn Vid. Medd. 1853: 100. 1854. *Plumajillo*; *Besinic-che* (Petén, Maya); *Cola de ardilla* (Petén); *Tarajay* (fide Aguilar).

Mostly in dry forest or thickets, often along rocky stream beds, 1,300 meters or less; Petén; Alta Verapaz; Zacapa; Chiquimula; Baja Verapaz; El Progreso; Jutiapa; Quiché; Huehuetenango. Mexico; British Honduras; southern Florida; Salvador; Costa Rica; West Indies; South America.

A large shrub or a tree, sometimes 15 meters high but usually lower, the branchlets pubescent; leaflets 19–51, oval or oblong, 1–2.5 cm. long, green and glabrous above, pale and sericeous beneath, rounded at each end, membranaceous; flowers small, green or yellowish white, the staminate racemes about 20 cm. long; pistillate racemes very dense and plume-like, 13 cm. long or less, the flowers on slender pedicels; samaras narrowly lance-oblong, 1–1.5 cm. long, densely pilose, the margins densely ciliate with long slender spreading hairs.

Sometimes called “palo de sobo” in Salvador, “zorra” in Honduras, and “palo de hormigas” in Yucatan. The Maya name of Yucatan is reported as “belzinic-che,” “beezinic-che,” and “suetsinic-che,” said to signify “ant path tree.” The tree is abundant and conspicuous in many parts of the dry lower Motagua Valley, from Fiscal and El Rancho to Salamá, and on the hills of Zacapa and Chiquimula. The leaves are deciduous. The wood is said to be valued for fuel because it burns slowly and for a long time.

PICRAMNIA Swartz

Shrubs or trees; leaves alternate, odd-pinnate, the leaflets opposite or sub-alternate, entire; flowers dioecious, in long slender spikes or racemes opposite the leaves, pendent, the flowers small, greenish; calyx 3–5-parted, the segments imbricate; petals 3–5, rarely none, linear, imbricate; stamens 3–5, opposite the petals, inserted at the base of the disk; filaments naked, inflexed; disk depressed, lobate; ovary 2–3-celled, the style short, 2–3-fid, the lobes recurved, or the stigmas 2–3 and sessile; ovules 2 in each cell, collateral near the apex of the cell; fruit baccate, 1–2-celled, the cells 1-seeded; seeds pendulous, plano-convex, with membranaceous testa; endosperm none.

About 30 species, in tropical America. Two or three other species are found in southern Central America.

Inflorescences laxly branched. *P. polyantha*.
Inflorescences simple.

Sepals and petals usually 4 each.

Rachis of the inflorescence densely pilose-tomentose, the rachis completely concealed by the hairs. *P. tetramera*.

Rachis of the inflorescence sparsely short-pilose or glabrate, not concealed by the hairs.

Leaflets glabrous beneath or essentially so. *P. quaternaria*.

Leaflets densely pubescent beneath on the costa. *P. brachybotryosa*.

Sepals and petals usually 3 each.

Leaflets quite glabrous beneath. *P. antidesma*.

Leaflets pubescent beneath, at least on the costa.

Leaflets appressed-pilose beneath over most of the surface, subcoriaceous, usually yellowish when dried. *P. andicola*.

Leaflets glabrous beneath or nearly so except on the costa, there densely pubescent.

Leaflets mostly 3–7 cm. long, rather widely spaced on the rachis.

P. teapensis.

Leaflets 1.5–3 cm. long, crowded on the rachis. *P. locuples*.

Picramnia andicola Tulasne, Ann. Sci. Nat. III. 7: 265. 1847.

Moist or wet, mixed forest, 1,000 meters or less; Huehuetenango (region of Democracia). British Honduras, probably extending into Petén; southern Mexico, type from mountains of Veracruz.

A slender shrub or a small tree, the branchlets at first pubescent with short subappressed yellow hairs, later glabrate; leaflets mostly 7-9, yellowish green when dried, the slender rachis hispidulous or glabrate, the blades elliptic-ovate to ovate-oblong, mostly 5-10 cm. long, subcoriaceous, gradually or abruptly acuminate or long-acuminate with an obtuse tip, obtuse to cuneate at the base, glabrous above, beneath sparsely appressed-hispidulous over most of the surface with yellowish hairs, or in age glabrate; staminate racemes very slender, usually longer than the leaves, interrupted, arcuate, the rachis hispidulous, the flowers densely glomerate, on very short pedicels, 3-parted; pistillate racemes sometimes longer than the leaves but usually shorter, the flowers long-pedicellate; fruit subglobose, 7 mm. in diameter or larger.

This is closely related to *P. antidesma*, and may be only a variety of that species.

Picramnia antidesma Swartz, Prodr. Veg. Ind. Occ. 27. 1788.

Moist or wet thickets or forest, little above sea level; Petén (Río Machaquila, *Steyermark* 45968). British Honduras; southern Mexico; Honduras.

A shrub or tree, usually 6-9 meters tall, the branchlets appressed-pilose or almost glabrous; leaves often yellowish when dried, the rachis sparsely pubescent or glabrate; leaflets usually 7-13, lance-oblong to rhombic-oblong or oblong-ovate, commonly 5-9 cm. long, usually abruptly obtuse-acuminate, very oblique at the base, lustrous, glabrous or essentially so, mostly subcoriaceous; flowers whitish, the staminate in long slender interrupted racemes equaling or longer than the leaves, the rachis puberulent or glabrate, the flowers 3-parted, densely clustered, short-pedicellate, scarcely 1 mm. long; pistillate racemes often longer than the leaves and pendent, the flowers long-pedicellate; fruits oval or ellipsoid, 1-1.5 cm. long, red.

Called "chilillo" in Chiapas and "quinina" in Honduras. In the latter country a tea made from the bark is a local remedy for malaria, and the tree has been used for the same purpose in other regions, perhaps because the intensely bitter flavor of the bark suggests quinine. The taste of the leaves and bark also has a suggestion of licorice. The bark was formerly much exported from the West Indies to Europe, where it was employed in treating venereal disease, erysipelas, and other affections.

Picramnia brachybotryosa Donn. Smith, Bot. Gaz. 46: 110. 1908.

Moist or wet forest or thickets, 750 1,800 meters; Alta Verapaz (type collected near Cobán, 1,550 meters, *Tuerckheim* II.1801); Escuintla; Sacatepéquez; Chimaltenango; Huehuetenango; Retalhuleu; Quezaltenango; perhaps endemic, but to be expected in neighboring countries.

Usually a slender shrub of 2-3 meters, sometimes a small tree, the branchlets puberulent or finally glabrate; leaflets membranaceous, generally blackening when dried, mostly 11-15, short-petiolulate, oblong-ovate to broadly ovate, often rhombic-oblong, mostly 3-8 cm. long, rather abruptly obtuse-acuminate, rounded or obtuse and very unequal at the base, glabrous above or nearly so, densely puberulent beneath along the costa, elsewhere glabrous; staminate racemes very slender, often curved, shorter or often longer than the leaves, the rachis puberulent or glabrate, the flowers densely fasciculate, mostly 4-parted, dark red, the fascicles remote, the pedicels very short; sepals scarcely 1 mm. long; pistillate racemes mostly shorter than the leaves, pendent, the flowers dark red, long-pedicellate; fruits oval, 10-14 mm. long, bright red, finally turning black.

The shrub is a rather conspicuous and handsome one when covered with the drooping racemes of large cherry-like fruits.

Picramnia locuples Standl. in Yuncker, Field Mus. Bot. 17: 372. 1938 (type collected near Siguatepeque, Honduras).

Moist or wet forest, 1,200 1,800 meters; Chiquimula (near Jocotán and Camotán). Mountains of Honduras.

A slender shrub or small tree 2-6 meters high, the trunk 5 cm. or less in diameter, the branchlets densely short-pilose; leaflets about 19, small, membranaceous, short-petiolulate or subsessile, mostly 1.5-3 cm. long and 8-12 mm. wide, obliquely ovate to lance-oblong, obtuse or acuminate with obtuse tip, very oblique at the base, densely pilosulous or puberulent along the costa, elsewhere glabrous; pistillate inflorescence simple, slender, 8 cm. long or less, the rachis densely short-pilose, the pedicels 8-10 mm. long, mostly glabrous; fruit subglobose or oval, about 1.5 cm. long, rose-red or bright red.

The species is closely related to *P. teapensis*, and further material is needed to decide whether it really is distinct or not.

Picramnia polyantha (Benth.) Planch. Lond. Journ. Bot. 5: 577. 1846. *Rhus polyantha* Benth. Pl. Hartweg. 60. 1840 (type from Chinantla, Oaxaca).

Dry rocky hillsides in sparse pine-oak forest, Baja Verapaz (Santa Rosa, *Standley* 69807); Quiché. Southern Mexico.

A shrub about 3 meters high, the slender branchlets densely pilose with short, pale, mostly cinereous hairs; leaflets mostly 5-9, subcoriaceous, ovate to ovate-oblong, 5-10 cm. long, acute or long-acuminate, with a slender narrow attenuate tip, rounded and only slightly oblique at the base, glabrous above and lustrous, paler beneath and densely strigose, on rather long petiolules; staminate and pistil-

late panicles much branched, the branches very long and flexuous, often bearing large, foliaceous, linear or oblong bracts, the flower clusters remote, dense; sepals 5, about 1 mm. long, the linear petals 2 mm. long; young fruit strigose.

Picramnia quaternaria Donn. Smith, Bot. Gaz. 20: 3. 1895.
Coralillo; Palo de café (Jalapa).

Moist or wet thickets or forest, chiefly in ravines, 2,700 meters or less; El Progreso; Zacapa; Jalapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez (type from Volcán de Fuego, 1,800 meters, J. D. Smith 2562); Huehuetenango; Quezaltenango; San Marcos. Honduras; Salvador; Costa Rica.

A slender shrub or small tree, 6 meters high or less, the branchlets densely pilose with short, mostly ochraceous hairs or glabrate; leaflets mostly 9–15, membranaceous or thicker, mostly lance-oblong and 5–8 cm. long, attenuate or acuminate, with obtuse tip, mostly acute and very unequal at the base, glabrous or practically so, sometimes with a few scattered hairs beneath, short-petiolulate; racemes simple, the staminate very slender and flexuous, green, or the flowers sometimes dark red, sometimes 75 cm. long, pendent, the rachis sparsely pubescent or glabrate, the flower clusters remote, with few or numerous flowers, the pedicels glabrous, 4 mm. long or less; sepals usually 4, ovate, 1.5 mm. long, pubescent; pistillate racemes usually shorter than the staminate but often equaling the leaves, the flowers long-pedicellate; fruit oval, 10–15 mm. long, bright red.

Sometimes called "aceitunito" in Salvador.

Picramnia teapensis Tulasne, Ann. Sci. Nat. III. 7: 265. 1847.

Moist or wet, dense, mixed forest, 700–1,700 meters; Escuintla; Suchitepéquez; Quezaltenango; San Marcos. Type from Teapa, Tabasco; Honduras.

A slender shrub or tree, sometimes 9 meters tall but usually lower, the branchlets densely pilose with short yellowish hairs; leaflets mostly 7–17, membranaceous, very asymmetric, lance-oblong to rhombic-ovate, chiefly 3–7 cm. long, more or less narrowed to the narrow obtuse apex, very oblique at the base, rounded to subacute, puberulent or short-pilose along the costa, elsewhere glabrous or nearly so, the slender rachis densely puberulent; flowers 3-parted, the staminate racemes dense and many-flowered, equaling or often much shorter than the leaves, the rachis sparsely pilose, the slender pedicels glabrous, 5 mm. long or less; flowers mostly dark red, the sepals glabrous; fruit oval, 1 cm. long or slightly larger, becoming red and finally black.

Called "quinina" in Honduras.

Picramnia tetramera Turcz. Bull. Soc. Nat. Moscou 36, pt. 1: 598. 1863. *P. Matudai* Lundell, Phytologia 1: 241. 1937 (type from Mount Ovando, Chiapas, *Matuda* 428).

Moist or wet, mixed forest, 1,300 2,800 meters; Izabal; Huehuetenango; Quezaltenango; San Marcos. Veracruz to Chiapas; Honduras.

A shrub or tree 3-9 meters high, the slender branchlets covered with a dense close pale tomentum; leaves large, the rachis rather stout, very densely pale-tomentose; leaflets mostly 7-13, subcoriaceous, mostly oblong or oblong-ovate, or sometimes ovate, usually 10-15 cm. long, acute or acuminate, broadly rounded to obtuse at the base, conspicuously oblique, glabrous above except on the costa, usually lustrous, densely velutinous-pilose beneath with short, rather dense hairs; flowers dark red; staminate racemes equaling or often longer than the leaves, usually very dense and many-flowered, sometimes interrupted, often arising from old naked branches, the rachis rather stout, densely tomentose, the pedicels scarcely more than 1 mm. long; sepals usually 4, sometimes 3; fruit glabrous, oval to globose-obovoid, about 1.5 cm. long, scarlet.

QUASSIA L. *Quassia*

Shrubs or small trees, glabrous, with intensely bitter foliage and bark; leaves alternate, odd-pinnate, the petiole and rachis broadly winged, the leaflets few, opposite, entire; flowers perfect, large, red, in terminal, simple or branched racemes, the pedicels bracteate at the base, articulate and 2-bracteolate at the apex; calyx small, 5-parted, the segments imbricate; petals 5, elongate, erect, contorted in bud; torus large, columnar; stamens 10, inserted at the base of the torus, the filaments filiform, bearing small villous scales; ovary 5-lobate, the lobes inserted upon the torus, free; styles united to form 1 elongate contorted one, the stigma 5-sulcate; ovules solitary, pendulous; drupes 5 or by abortion fewer, the putamen crustaceous, carinate; seed pendulous, with membranaceous testa; cotyledons plano-convex, carnose, the radicle very short, retracted.

Two or three species, in tropical America and Africa. Only the following is found in North America.

Quassia amara L. Sp. Pl. ed. 2. 553. 1762.

Moist or wet forest, 250 meters or less; Izabal; Santa Rosa. Southern Mexico; British Honduras; Nicaragua; Costa Rica; Panama; northern South America.

A large shrub or small tree, usually 6 meters high or less; leaves large, the leaflets usually 5, sessile, membranaceous, mostly obovate to oblong-oblancoate and 9 15 cm. long, acute or short-acuminate, long-attenuate to the base, deep green above, slightly paler beneath; panicles narrow, about as long as the leaves, rather few-flowered; calyx 2 3 mm. long, the segments ovate, obtuse, ciliate; petals 2.5-4.5 cm. long, linear or linear-lanceolate, glabrous, bright red or rose; stamens usually longer than the corolla; drupes oval or obovoid, 1-1.5 cm. long, black, the torus red or purple.

The plant is the source of quassia, the bitterwood of commerce. All its parts contain a bitter principle, quasin, with tonic properties,

formerly considered of value in treating fevers. Most of the wood reaching the United States is said to come from Surinam. It is employed as an insecticide, sometimes as a substitute for hops in manufacture of ale and beer, and as an ingredient of certain proprietary medicines and conditioning powders for domestic animals. The bark is grayish white; wood white or slightly yellowish, odorless, with a persistent bitter taste; light and soft, with a specific gravity of about 0.50, easy to cut, resistant to insects but not to decay. In Costa Rica the tree is known by the names "hombrón" and "hombre grande."

Simaba Cedron Planch. Called "cedrón" in Central America. Native in the Pacific lowlands of Costa Rica, and planted in Salvador. It may occur in the Pacific lowlands of Guatemala, but there is no good evidence to this effect. The seeds are sold commonly in the markets of Guatemala for medicinal purposes and are said to come from the *costa* or from Salvador, but the vendors really know nothing about their source. The large seeds have a high reputation in Central America as a remedy for fevers and snake bites.

SIMAROUBA Aublet

Reference: Arthur Cronquist, The genus *Simarouba*, Bull. Torrey Club 71: 226-234. 1944.

Trees, the leaves alternate, even-pinnate, the leaflets alternate, coriaceous, entire; flowers small, dioecious, in axillary and terminal panicles; calyx small, 5-lobate, the lobes imbricate; petals 5, imbricate in bud, with spreading tips; disk of the staminate flower hemispheric, villous; stamens 10, inserted at the base of the disk, included, the filaments with a small scale at the base; ovary inserted on a disk, 5-parted; styles connate, the stigma broad, 5-lobate; ovules solitary; drupes 1-5, sessile; seed inverted, with membranaceous testa, the cotyledons carnose, the radicle very short, retracted.

About 6 species, all in tropical America. Only the following are known from North America.

Petals 4-6 mm. long; flowers solitary or geminate; calyx inconspicuously ciliate or eciliate; leaves usually glaucescent beneath... ..*S. glauca*.

Petals about 2.5-4 mm. long; flowers usually densely aggregate; calyx conspicuously ciliate; leaves not glaucescent beneath... ..*S. amara*.

Simarouba amara Aubl. Pl. Guian. 2: 860. pls. 331, 332. 1757.
Acetituno; Cujitile (Jutiapa).

Moist thickets or wet forest, 850 meters or lower; Petén; Jutiapa (near Jutiapa). British Honduras; Salvador; Panama; Lesser Antilles; South America.

A small or medium-sized tree, glabrous throughout except in the inflorescence, there usually sparsely puberulent; leaves large, the leaflets petiolulate, subcoriaceous, oblong, mostly 5-12 cm. long, very obtuse or rounded at the apex and apiculate, obliquely cuneate at the base, green and lustrous above, paler green and dull beneath, scarcely glaucescent; panicles often 30 cm. long or more and much branched, the numerous flowers densely aggregate on the branches, sessile or pedicellate; calyx 1 mm. long or shorter, the lobes rounded or deltoid-orbicular, acute or subacute, conspicuously ciliate; petals usually 2.5 mm. long; fruit large and plum-like, similar to that of the following species.

Known in British Honduras by the name "negrito." This species seems to be rare in Central America, while *S. glauca* is common and widely distributed. The Guatemalan material is referred by Cronquist to var. *opaca* Engler, which differs little if at all from the typical form of the species.

Simarouba glauca DC. Ann. Mus. Paris 17: 424. 1811. *Aceituno*; *Negrito*; *Jucumico*; *Zapatero* (Petén); *Pasac* (Petén, Maya); *Chapascuapul* (Petén); *Jocote de mico*.

Moist or usually dry forest or thickets, often on dry open rocky hillsides, common in many regions along stream beds, 900 meters or less; Petén; Baja Verapaz; Izabal; El Progreso; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Retalhuleu; Quiché. Southern Florida; southern Mexico; British Honduras to Salvador and Panama; Cuba.

A small or medium-sized tree, sometimes 15 meters high with a trunk 30 cm. or more in diameter, glabrous; leaves large, the leaflets mostly 10-20, coriaceous, oblong or narrowly oblong, sometimes obovate-oblong, mostly 5-10 cm. long, rounded at the apex, acute and unequal at the base, green above, pale or glaucescent beneath, the margins often revolute; panicles large, often longer than the leaves, rather open and lax, the flowers whitish; calyx 3-3.5 mm. wide, the lobes ovate or triangular, obtuse or acute, ciliolate; petals oblong or ovate, 4-6 mm. long; drupes oval or oblong-oval, mostly 1.5-2 cm. long, slightly oblique, with thick white pulp, bright red at first, turning black when ripe.

This is presumably the plant reported from Guatemala by Hemsley as *S. versicolor* St. Hil. The fruit closely resembles an olive, hence the local name "aceituno." The fruit is eaten commonly, but is of inferior quality and not highly esteemed. The white juicy flesh is slightly astringent, sweetish, and insipid. The fruits ripen during the latter part of the dry season, and often are offered for sale in the markets. The tree is particularly abundant on the dry hills of the lower Motagua Valley, and upon the barren hillsides

above Salamá, where in late April the trees are conspicuous because of the abundance of brilliant red young fruits, reminding one of small plums. An infusion of the bitter bark has been used in Costa Rica as a remedy for malaria. The wood is white, yellowish, or slightly brownish, light and soft, with a specific gravity of about 0.40, easy to work, weak, bitter, inodorous, and not durable. In Central America it is sometimes used for fuel, especially because it burns readily when still green and freshly cut.

The species was described from Havana, Cuba, and the form of the species considered typical by Cronquist is reported only from Cuba and Jamaica. Central American material he refers to var. *latifolia* Cronquist (Bull. Torrey Club 71: 231. 1944).

SURIANA L.

Shrubs or small trees, the leaves alternate, simple, entire, narrow; flowers perfect, solitary or in terminal few-flowered fascicles; sepals 5, persistent; petals 5, imbricate; stamens 10, the filaments filiform, free or nearly so, unequal, those opposite the petals shorter; disk adnate to the base of the calyx or obsolete; carpels of the ovary 5, distinct, 1-celled; styles 5, lateral, filiform, the stigmas capitate; ovules 2 in each cell, collateral, ascending; fruiting carpels achene-like; embryo hippocrepiform.

A single species.

Suriana maritima L. Sp. Pl. 284. 1753.

Sandy thickets of seashores, Yucatan and British Honduras; possibly also on the north coast of Guatemala; southern Florida; West Indies; South America; Old World tropics.

A densely branched shrub 1-2 meters high, said to be in some regions a small tree; leaves crowded on the branches, somewhat fleshy, sessile, linear-spatulate, 1-4 cm. long, 2-6 mm. wide, obtuse, densely pubescent; flowers small and inconspicuous, yellow, the sepals narrowly lanceolate to ovate, 6-10 mm. long, acuminate; petals obovate, 7-9 mm. long, crose at the apex; fruit 8-10 mm. broad, the dry carpels 4-5 mm. long, finely pubescent.

A characteristic strand plant in some parts of the West Indies, but rare on the North American continent.

BURSERACEAE

References: Joseph N. Rose, Burseraceae, N. Amer. Fl. 25: 241-261. 1911. J. J. Swart, A monograph of the genus *Protium* and some allied genera, Rec. Trav. Bot. Néerland. 39: 211-446. 1942.

Shrubs or trees, often producing balsam or oily resin; leaves alternate, without stipules, generally odd-pinnate, sometimes 3-foliolate or 1-foliolate, usually not

pellucid-punctate; flowers small, perfect or polygamo-dioecious, racemose or paniculate; calyx with 3-5 lobes or sepals, these imbricate or valvate; petals 3-5, erect or spreading, free or rarely connate, deciduous, imbricate or valvate in bud; disk annular or cupular, free or adnate to the calyx tube; stamens twice as many as the petals or rarely of the same number, inserted at the base or margin of the disk, equal or unequal, the filaments free, naked, subulate; anthers subglobose or oblong, 2-celled, commonly versatile; ovary free, 2-5-celled, trigonous, ovoid, or globose, often attenuate to a short style, the stigma undivided or 2-5-lobate; ovules 2 in each cell, affixed to the axis of the cell above the middle, usually pendulous and collateral; fruit drupaceous or dry, dehiscent or indehiscent, containing 2-5 nutlets with osseous or chartaceous walls; seeds pendulous, with membranaceous testa; endosperm none.

About 17 genera, in tropics of both hemispheres. Only the following genera are represented in continental North America.

Petals imbricate in bud, distinct; fruit dry, dehiscent; leaves often abundantly pubescent, 1-foliate, 3-foliate, pinnate, or bipinnate *Bursera*.

Petals valvate in bud; fruit drupaceous; leaves glabrous or nearly so, pinnate.

Petals united

Tetragastris.

Petals distinct

Protium.

BURSERA L.

References: A. A. Bullock, Notes on the Mexican species of the genus *Bursera*, Kew Bull. 346 387. 1936. Further notes on the genus *Bursera*, Kew Bull. 447 457. 1937; Kew Bull. 163-168. 1938.

Shrubs or trees, usually with thin exfoliating bark, the sap strong-scented, producing resin or balsam; leaves deciduous, mostly near the ends of the thick branches, odd-pinnate, twice pinnate, 3-foliate, or 1-foliate, the leaflets opposite, membranaceous or coriaceous, entire or serrate, the rachis naked or winged; flowers small, whitish, polygamous or perfect; calyx small, 3-4-parted or 3-4-lobate, the lobes imbricate; petals 3 4, spreading or reflexed; disk annular, crenate; stamens 6 8, short, subequal, inserted at the base of the disk; ovary 3-5-celled, the style very short, the stigma 3 5-lobate; capsule ovoid or subglobose, symmetric or oblique, 2 3-valvate, the nutlets osseous, often solitary; seeds plano-convex, the testa membranaceous or coriaceous; radicle short, superior.

Perhaps 80 species, all in America, from Florida and Arizona southward, a few species extending far southward in South America. Most of the species are Mexican. Probably only the following ones occur in Central America. While plants of this genus are rather common in various parts of Guatemala, they are much more plentiful in Mexico, where they are of considerable economic importance. They all yield a fragrant resin known as copal, which is much used in domestic medicine and for varnish. It has been burned as incense in the temples since preconquest times. The term "copal," of Nahuatl, i.e. Aztec, origin is now applied in commerce to various

resins that come from Africa, the East Indies, and South America. In fact most commercial copal comes from those regions. The treatment of this as well as the other genera in *North American Flora* is artificial and altogether unsatisfactory and unusable. The excellent papers by Bullock, cited above, contain the first intelligible account of the species and a remarkably simple and satisfactory key for their separation.

Leaves with only 1-3 leaflets.

Leaflet 1, entire, rounded or emarginate at the apex.....*B. Schlechtendalii*.

Leaflets 3, acute at the apex to rounded and short-caudate.

Leaflets crenate.....*B. Steyermarkii*.

Leaflets entire.....*B. permollis*.

Leaves with 5 to numerous leaflets.

Leaves bipinnate, the leaflets very numerous.

Leaflets mostly 3-7 mm. long.*B. bipinnata*.

Leaflets 15-40 mm. long.*B. diversifolia*.

Leaves once pinnate, or a few of those on young sterile branches sometimes bipinnate.

Leaf rachis not at all winged; leaflets entire.....*B. Simaruba*.

Leaf rachis conspicuously winged; leaves coarsely crenate.

Leaflets acuminate or long-acuminate, usually glabrous, thin, not rugose, cuneate at the base.....*B. graveolens*.

Leaflets obtuse or acute, usually densely pilose on both surfaces, coriaceous, more or less rugose, usually broadly rounded at the base...*B. excelsa*.

Bursera bipinnata (Sessé & Moc.) Engler, Bot. Jahrb. 1: 44. 1881. *Amyris bipinnata* Sessé & Moc. ex DC. Prodr. 2: 82. 1825. *B. gracilis* Engler in DC. Monogr. Phan. 4: 50. 1883. *Elaphrium gracile* Rose, N. Amer. Fl. 25: 249. 1911. *B. bipinnata* var. *ovalifolia* Donn. Smith, Bot. Gaz. 27: 332. 1899 (type from Dept. Huehuetenango, 1,400 meters, *Seler* 3108). *B. verapacensis* Pittier, Journ. Wash. Acad. Sci. 11: 229. 1921 (type collected between Salamá and Rabinal, Baja Verapaz, O. F. Cook & C. B. Doyle 283). *Copal pom* (Huehuetenango); *Pom*; *Copal*; *Copalán*; *Copal santo*.

Dry hillside slopes or brushy plains, 250-1,400 meters; Baja Verapaz; Zacapa; Jalapa; Jutiapa; Escuintla; Guatemala; Quiché; Huehuetenango. Mexico; Salvador.

A shrub or tree 1.5-8 meters high with a low thick trunk and low, spreading, densely branched crown, the branchlets pilosulous or glabrate; leaves fern-like, 2 or more times pinnate, the leaflets very numerous, rounded-ovate to linear-lanceolate, coriaceous, 3-7 mm. long, densely hirtellous or pilose or almost glabrous, lustrous on the upper surface, pale beneath, the rachis conspicuously winged; inflorescences mostly small and few-flowered; flowers 4-parted; drupes green or red, glabrous, about 6 mm. long, 2-valvate.

Called "copal santo" in Salvador. This and *B. excelsa* are abundant everywhere on plains and low hills about Jalapa, the two often growing together. They are equally plentiful about Jutiapa, and in other parts of the Oriente. *B. gracilis* often has been maintained as a distinct species, but it differs from *B. bipinnata* only in having more abundant pubescence, a variable character in this genus.

Bursera diversifolia Rose, Contr. U. S. Nat. Herb. 5: 113. 1897. *Elaphrium diversifolium* Rose, N. Amer. Fl. 25: 248. 1911. *Copal pom hembra* (Huehuetenango).

Dry woods and brushy plains, 1,000-1,400 meters; Jalapa; Huehuetenango. Mexico (the type from Chiapas, *E. W. Nelson* 3066).

A shrub or small tree 3.5-8 meters high with spreading branches, the older branchlets glabrous, shining, reddish, the younger ones pubescent; leaves fern-like, two or more times pinnate with 4-10 pairs of leaflets, the lower divisions often again pinnate with 3-7 leaflets; leaflets numerous, ovate to oblong or the terminal ones elliptic-obovate, firmly membranaceous to subcoriaceous, 1.5-4 cm. long, 7-20 mm. wide, coarsely serrate, obtuse to acute, rounded or obtuse at the base, or the terminal ones cuneate, puberulent to glabrate and lustrous on the upper surface, usually densely and softly pubescent and reticulate beneath, the rachis between the leaflets narrowly winged; inflorescence contracted; flowers 4-parted; drupes glabrous, 8-10 mm. long, 2-valvate.

In Guatemala this species has been found growing with *B. bipinnata* and *B. excelsa*, and may possibly be a hybrid between those two species.

Bursera excelsa (HBK.) Engler in DC. Monogr. Phan. 4: 57. 1883. *Elaphrium excelsum* HBK. Nov. Gen. & Sp. 7: 30. pl. 611. 1824. *Copal*; *Inciense*; *Copakillo real*; *Copal de tecomajaca*; *Tecomajaca* (Huehuetenango); *Campón* (Zacapa).

Brushy, usually dry slopes, often seen in hedgerows, 800-1,800 meters; El Progreso; Zacapa; Jalapa; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez; Quiché; Huehuetenango. Widely distributed in Mexico.

A shrub or tree, sometimes 7-8 meters high but usually lower, the bark dark reddish; young branchlets stout, densely short-pilose or glabrate; leaves pinnate, with usually 5-9 leaflets, or some of the leaves partially or completely bipinnate, the rachis narrowly winged; leaflets oval to ovate or oblong-ovate, mostly 2.5-5 cm. long, sometimes lobate, coarsely crenate, acute or obtuse, somewhat oblique at the base and usually broadly rounded or even truncate, rugose, often lustrous above, sparsely or usually densely pubescent or pilose on both surfaces; panicles much shorter than the leaves, the flowers 4-parted; fruit bivalvate, subglobose, about 1 cm. long, glabrous.

This species is common in many parts of the Oriente. In Sacatepéquez it is often planted for hedges and possibly has been introduced there. It has been reported from Guatemala under the name *B. Palmeri* Watson. It is probably this species that was reported by Loesener from Nentón, Huehuetenango (*Seler* 3091), as *B. tomentosa* Triana & Planch. The copal of this species is used in Guatemala for making varnish for local use.

Bursera graveolens (HBK.) Triana & Planch. Ann. Sci. Nat. V. 14: 303. 1872. *Elaphrium graveolens* HBK. Nov. Gen. & Sp. 7: 31. 1824. *Brasil colorado*; *Chicle*.

Mostly on dry rocky hillsides, 200–500 meters; Zacapa (vicinity of Zacapa). Yucatan; Honduras; Salvador; Costa Rica; Colombia to Peru.

A tree of 6–9 meters, the branches ferruginous, glabrous or nearly so, the leaves clustered at their tips; leaf rachis narrowly winged; leaflets 7–9, membranaceous, lance-oblong or ovate-oblong, mostly 3.5–7 cm. long, acuminate or long-acuminate, usually cuneate at the base, coarsely crenate-serrate, puberulent or almost wholly glabrous; panicles rather lax, equaling or shorter than the leaves, glabrous or nearly so; flowers 4-parted, 3 mm. long, slender-pedicellate; fruit glabrous, 1 cm. long.

Called “copalillo” in Salvador. The Maya name of Yucatan is “nabanche.”

Bursera permollis Standl. & Steyerl. Field Mus. Bot. 23: 166. 1944. *Jiote*; *Palo jiote de huis*.

Open or brushy hillsides or plains, sometimes in hedges, 800–1,400 meters; endemic; Chiquimula (Cerro Caracol, north of Quezaltepeque); Jutiapa (type collected near Jutiapa, *Standley* 75245).

A tree about 5 meters high, the branchlets thick, pale, densely pilosulous with spreading hairs; leaves long-petiolate, 3-foliate, the petiole 4–5 cm. long, softly pilosulous; leaflets on petiolules 3–12 mm. long, thick-membranaceous, very variable in shape, orbicular to broadly elliptic, rounded-rhombic, or obovate-orbicular, 5–10 cm. long, 4–8.5 cm. wide, obtuse or usually rounded at the apex and abruptly short-caudate, broadly cuneate at the base or usually rounded or subcordate, entire, sparsely pilose above, beneath densely velutinous-pilose, the nerves and veins elevated, laxly reticulate; inflorescences arising from defoliate nodes, short, few-flowered, the thick rachis pilosulous, the flowers (in fruit) on very short, thick pedicels; fruit 3-valvate, rather densely puberulent or glabrate, 1 cm. long, obtuse; seed 1, bone-white, 8 mm. long, 6 mm. broad.

This small tree is rather common in the vicinity of Jutiapa.

Bursera Schlechtendalii Engler in DC. Monogr. Phan. 4: 41. 1883. *Elaphrium simplicifolium* Schlecht. Linnaea 16: 532.

1842, not *Bursera simplicifolia* DC. 1825. *B. Jonesii* Rose, Contr. U. S. Nat. Herb. 3: 314. 1895. *Jocote de iguana* (Chiquimula); *Brasil* (Zacapa); *Copalillo*; *Caraña* (Huehuetenango); *Jiote Colorado*; *Pom* (Huehuetenango).

Dry rocky hillsides, often in thickets along stream beds, 200-1,400 meters; El Progreso; Zacapa; Chiquimula; Jutiapa; Huehuetenango. Southern Mexico.

A glabrous shrub or small tree 4-6 meters high, the bark glossy grayish pink, peeling off in thin papery sheets, the branches thick and stout, dark ferruginous; leaves mostly crowded on short thick spurs, 1-foliate, short-petiolate, thick-membranaceous, cuneate-obovate or oval-obovate, mostly 1.5-4.5 cm. long, broadly rounded at the apex and often emarginate, cuneate-obtuse at the base, entire; flowers or at least the fruits on stout pedicels fasciculate on short leafy spurs; fruit 5-6 mm. long, trigonous, 3-valvate.

Bursera Simaruba (L.) Sarg. Gard. & For. 3: 260. 1890. *Pistacia Simaruba* L. Sp. Pl. 1026. 1753. *B. gummifera* L. Sp. Pl. ed. 2. 471. 1762. *Elaphrium ovalifolium* Schlecht. Linnaea 17: 248. 1843. *B. ovalifolia* Engler, Bot. Jahrb. 1: 43. 1881. *Jiote*; *Chino*; *Chinacahuite*; *Palo jiote*; *Solpiem*, *Cajha*, *Xacago-que* (Huehuetenango, fide Tejada); *Palo chino*; *Chacah*, *Chacah Colorado* (Petén, Maya); *Chacá* (Huehuetenango); *Palo mulato* (Petén); *Indio desnudo* (North Coast); *Chic-chica*, *Chicah* (Petén); *Cacah* (Quecchí).

Common or abundant in many lowland regions, often in primeval forest, but more plentiful in rather dry or moist, secondary forest or thickets, very common in fencerows, ascending from sea level to about 1,800 meters, but most frequent at 1,000 meters or less; Petén; Alta Verapaz; Baja Verapaz; Izabal; Zacapa; El Progreso; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Suchitepéquez; Retalhuleu; San Marcos; Huehuetenango; Quiché. Southern Florida; Mexico; British Honduras to Salvador and Panama; West Indies; northern South America.

A small or medium-sized tree, or in wet forest often 25 meters high or more and sometimes a meter in diameter, the young bark green or greenish brown, the old bark light red to dark reddish brown, peeling off in thin paper-like sheets, the branches thick and brittle or soft, the branchlets usually glabrous; leaves deciduous, the leaflets usually 5-7, on short or long petiolules, broadly ovate to ovate-oblong or lance-oblong, mostly 5-12 cm. long, acuminate or cuspidate-acuminate, more or less pubescent when young or almost glabrous, in age usually glabrous or nearly so, rarely persistently pilose beneath; flowers 3-parted, greenish or yellowish, fragrant, the panicles much shorter than the leaves, sometimes very short; fruit variable in size and shape, 6-10 mm. long, 3-valvate, usually tinged with red.

Known in British Honduras as "birch" or "gumbolimbo"; sometimes called "copón" in Honduras, "palo retinto" in Tabasco,

and "mulato" in Oaxaca and Veracruz. The usual name in Guatemala is "jiote," of Nahuatl derivation, given because of a fancied resemblance of the peeling bark to a skin disease common in tropical America. El Jiote is a *caserío* of the Department of Jutiapa. The name "chino" is used currently in Zacapa and Chiquimula. The name "indio desnudo," of only occasional use, is a particularly appropriate one, for the coppery trunks, especially when seen in a rather dark forest, have almost the appearance of an Indian's skin, so much so that one is likely to be startled by the sudden appearance of a tree.

The wood is whitish or light brown, often discolored blue, without distinctive odor or taste, light in weight, fairly soft but firm and tenacious; specific gravity 0.30; grain fairly straight to irregular, of medium to coarse texture, fairly strong, easy to work, finishes fairly smoothly, very perishable. It is suitable for boxes and crates, but little use is made of it in Guatemala, except for firewood or charcoal.

The wood is said to be employed in Guatemala for soles of *caites*, the sandals worn by many Indians. The principal use of the tree in Guatemala and all Central America is for living fenceposts, and for this purpose it is planted generally in the lowlands and sometimes to middle elevations. Branches placed in the ground take root quickly and develop into trees sufficiently large to hold barbed wire. Planted more densely, the trees form satisfactory hedges. Wisdom states that the young shoots developing in May and June are eaten by the people of the Jocotán region. He states also that copal is obtained from the tree in the same area. The trunk is notched and the resinous sap drains into gourds placed beneath. This is then boiled with water, the resin rising to the surface, where it is skimmed off and placed in cold water to harden. It is shaped into oblong blocks, very hard and brittle, which are wrapped in corn husks, tied at the ends with strips of corn husk, and in this form taken to market, to be used as incense in the churches. For ceremonial purposes among the Chorti Indians it is shaped into disks called *pesos*, the size of a small coin, and these are offered as payment to the Christian and other deities.

The tree is much used in domestic medicine, being one of the numerous "remedies" for snake bites. Poultices of the leaves are used in case of gangrene to prevent its spread. The resin often is used as a substitute for glue and as cement for mending broken china and glass. The Caribs employed it to paint their canoes, to

preserve them from the attacks of worms. The name "gumbo-limbo," used in British Honduras and even in southern Florida, is believed to be a corruption of the Spanish *goma elemi*, sometimes given by the Spaniards to the resin or copal.

In treating the species of *Bursera*, Bullock excludes *B. Simaruba* from the Mexican flora and presumably would exclude also the Central American forms, using instead the name *Bursera ovalifolia*. The type of *B. Simaruba* is Jamaican. The characters given by Bullock for separating the two species do not hold in Guatemalan material, and we see no reason for attempting to separate it from *B. Simaruba*. The species is a somewhat variable one, it is true, with a remarkably wide range, but treated as a single species *B. Simaruba* is immediately recognizable.

***Bursera Steyermarkii* Standl. Field Mus. Bot. 22: 147. 1940.**

Moist or dry, brushy plains or rocky brushy hillsides of the Oriente, 200-500 meters; endemic; Zacapa (near La Fragua); Chiquimula (type collected near Chiquimula, *Steyermark* 30068).

A small tree with spreading crown, the branchlets ferruginous, glabrous; leaves long-petiolate, the leaflets 3, thick-membranaceous, sessile, rhombic-obovate, cuneate-obovate, or oblanceolate-oblong, 4-6.5 cm. long, usually acute or acuminate, crenate almost to the base, obtuse to cuneate-attenuate at the base, densely velutinous-pilose; inflorescences lax and few-flowered, almost as long as the leaves or shorter, glabrous, the pedicels often 1 cm. long; fruit glabrous, obovoid, 1 cm. long, 2-valvate.

PROTIUM Burmann

Trees, usually glabrous or nearly so, sometimes pubescent; leaves large, membranaceous or coriaceous, usually drying brownish, odd-pinnate, rarely 1-foliate, the leaflets mostly entire; flowers small, perfect or polygamous, sessile or racemose, often forming rather large panicles; calyx 4-5-lobate or sinuate-dentate, the lobes imbricate; petals 4-5, subcoriaceous or membranaceous, valvate in bud; stamens 8-10, inserted at the base of the disk, connivent above the ovary, the anthers dorsifixed, oblong-triangular or oblong-ovate, opening by 2 longitudinal slits; disk 8-10-crenate, annular or urceolate; ovary 4-5-celled; stigma capitate, 4-5-lobate; drupe globose or ovoid, somewhat oblique, containing 4-5 nutlets or by abortion 1-3, the pericarp usually indehiscent, the nutlets 1-seeded; seed plano-convex or subtrigonus.

Species about 78, in the tropics of both hemispheres. Probably 2-4 additional species occur in southern Central America. The Central American species are incompletely known and, because of scant material, their number and limits still are very uncertain.

- Leaves finely pubescent; leaflets usually 3, sometimes 1 or 5; disk of the flower glabrous, the ovary pubescent.....*P. Schippii*.
 Leaves glabrous; leaflets usually 5-7.
 Disk of the flower glabrous, the ovary pubescent.....*P. Copal*.
 Disk of the flower and the ovary both glabrous.....*P. multiramiflorum*.

Protium Copal (Schlecht. & Cham.) Engler in DC. Monogr. Phan. 4: 83. 1883. *Icica Copal* Schlecht. & Cham. Linnaea 5: 601. 1830. *Pom* (Maya); *Chom* (Petén, fide Lundell); *Copal* (Petén); *Pom-te* (Quecchí).

Moist or wet forest, chiefly at 350 meters or less; Petén; Alta Verapaz; Izabal; Zacapa; San Marcos(?); Huehuetenango. Southern Mexico.

A medium-sized or large tree, sometimes 30 meters high, with thick trunk, glabrous throughout; leaves large, the leaflets long-petiolulate, oblong or narrowly oblong, mostly 10-18 cm. long, long-acuminate to obtuse, oblique and subacute at the base, often abruptly short-decurrent, entire, coriaceous or subcoriaceous; panicles axillary, lax, mostly 12 cm. long or shorter; fruit 1.5-3 cm. long, glabrous, apiculate, contracted and short-stipitate at the base.

This tree is believed to be the principal source of the copal or pom that is used in such large amounts in Guatemala in religious rites, especially by the Indians of the highlands. At such places as Chichicastenango and San Francisco El Alto one constantly sees parties of Indians carrying censers in which copal is burned, emitting smoke and a fragrant aroma. They swing these censers for hours on the steps of the churches and in the interiors, as they offer up their prayers. These devout Indians, oblivious to their surroundings, are one of the most impressive sights to be observed in Guatemala. The copal presumably is procured in much the same way as that of *Bursera Simaruba*. It probably has figured in religious ceremonies of the Mayan people for many centuries. They used it also as a varnish and in their medicine. The copal of Guatemalan markets is said to come in large part from the lowlands of Alta Verapaz, whence it is carried on men's backs to all parts of the republic.

Protium multiramiflorum Lundell, Field & Lab. 6: 11. 1937.

Moist or wet, mixed forest, at or little above sea level; British Honduras (type from Valentín, El Cayo District, *C. L. Lundell* 6212; also collected at Westmoreland, Toledo District, *W. A. Schipp* 1021).

A tree of 10-13 meters, the branchlets glabrous; leaflets 3-7, usually 7, glabrous, on petiolules 7-10 mm. long, oblong or oblong-elliptic, about 10 cm. long and 4 cm. wide, rather abruptly acuminate, cuneate at the base, entire, with 13-14 pairs of lateral nerves; inflorescences many-flowered, branched from the

base, glabrous, about equaling the petioles, the petiolules 2 mm. long; flowers 4-parted, 3 mm. long, ochroleucous; calyx cupuliform, the lobes triangular, acute; petals ovate-triangular, acute, inflexed-apiculate; ovary globose, 4-lobate, the stigma subsessile.

Known locally as "copal colorado."

Protium Schippii Lundell, Field & Lab. 6: 12. 1937.

Wet mixed forest, at or little above sea level; British Honduras (type from 22 Mile, Stann Creek Railway, *W. A. Schipp* 973; also at several other localities); Yucatan.

A tree, as much as 15 meters high, the branchlets minutely pilose when young, soon glabrate; leaflets 1-7, usually 3, on petiolules 4-10 mm. long, lance-oblong or oblong, 6.5-13.5 cm. long, 2.5-4.5 cm. wide, abruptly or gradually acuminate, acutely cuncate at the base, entire, puberulent or pilosulous on the nerves; inflorescences axillary, laxly branched from the base, about equaling the petioles, the pedicels 1-1.5 mm. long; flowers 4-parted, puberulent, 2.5-3 mm. long, ochroleucous; calyx cupuliform, the lobes triangular to semiorbicular, acute, about equaling the tube; petals elliptic-ovate, acute, carinose; fruit ovoid, 2-3-lobate, acute, glabrate, 2 cm. long, 1 cm. broad, red.

Called "copal macho" in British Honduras; the Maya name of Yucatan is "pom."

TETRAGASTRIS Gaertner

Large glabrous trees; leaves large, membranaceous or coriaceous, odd-pinnate, the few leaflets entire; flowers polygamous, the panicles few-flowered, shorter than the leaves, the flowers short-pedicellate or almost sessile, small; calyx small, cupular, 4-5-lobate, the lobes short, imbricate; petals 4-5, connate to form a campanulate corolla, the lobes much shorter than the tube, subvalvate; stamens 8-10, inserted beneath the disk, the filaments very short; anthers oblong, erect, the cells dehiscent by longitudinal slits; disk thick, obscurely 8-10-sulcate; ovary semi-immersed, ovoid, 4 5-celled; style very short or obsolete, the stigma capitate, 4 5-lobate; drupe globose or ovoid, 3 4-celled, the mesocarp thick, resinous, the 3 4 nutlets lignose.

Six species are known, ranging from British Honduras to the West Indies and Brazil. Only one has been found in Central America.

Tetragastris panamensis (Engler) Kuntze, Rev. Gen. 1: 107. 1891. *Hedwigia panamensis* Engler, Bot. Jahrb. 1: 42. 1881. *T. Stevensonii* Standl. Field Mus. Bot. 4: 216. 1929 (type from British Honduras, *N. S. Stevenson* 9, without definite locality).

Moist or wet, mixed forest, at or little above sea level; British Honduras, along the Atlantic coast to Panama; Guianas; probably occurring in Izabal.

A glabrous tree 12-15 meters high or larger, the trunk 25 cm. or more in diameter; leaves large, the leaflets usually 7, coriaceous, on petiolules 4-7 mm. long, oblong or lance-oblong, 7-12 cm. long, 2.5-4 cm. wide, long-acuminate with an obtuse tip, obtuse or subacute at the base; panicles 18 cm. long or less, the branches sometimes sparsely and minutely puberulent, the thick pedicels 1-2 mm. long; calyx 2.5 mm. broad, 1.5 mm. high, minutely and sparsely puberulent, very shallowly lobate, the lobes broadly rounded; corolla narrowly campanulate, 5 mm. long, minutely puberulent outside, the lobes obtuse, recurved at the apex; stamens 1-2 mm. long.

Vernacular names recorded from British Honduras are "carbón" and "copal."

MELIACEAE. Mahogany Family

References: Percy Wilson, *Meliaceae*, N. Amer. Fl. 25: 263-296. 1924. Hermann Harms, *Meliaceae*, Nat. Pflanzenfam. 19bI: 1-172. 1940.

Trees or shrubs; leaves alternate, rarely opposite, pinnately or digitately compound, rarely 1-foliolate or simple, without stipules, the leaflets mostly entire, sometimes with pellucid dots or lines; inflorescence axillary or terminal, generally paniculate; flowers regular, perfect, rarely polygamous-dioecious; calyx with 4-5 lobes or sepals; petals normally 4-5, imbricate or valvate, free or rarely short-connate or adnate to the lower part of the stamen tube, sometimes carinate on the inner face; stamens 8-10 or rarely fewer, the filaments united to form an entire, dentate, or lobate tube, rarely free; anthers sessile or stipitate, inserted within the mouth of the tube or on its margin, 2-celled, longitudinally dehiscent; disk annular or columnar, free or adnate to the stamen tube or ovary; ovary of 2-5 united carpels, 2-5-celled, the style elongate; stigma disk-like or capitate, simple or sulcate; ovules 2 or more in each cell, collateral or superposed, rarely solitary; fruit capsular, septicidally or loculicidally dehiscent, sometimes drupaceous or baccate; seeds solitary or numerous in each cell, sometimes samaroid; endosperm carnose or none; embryo straight or transverse, the cotyledons carnose or foliaceous; radicle superior or lateral.

About 45 genera, widely dispersed in the tropics of both hemispheres. All North American genera are represented in Guatemala.

Leaves 2-3-pinnate; fruit drupaceous; petals purple.....*Melia*.

Leaves once pinnate or rarely 1-3-foliolate; fruit capsular; petals not purple.

Filaments free; seeds winged.....*Cedrela*.

Filaments united for part or all their length; seeds not winged except in *Swietenia*.

Seeds bearing a large wing; leaflets with very long, slender, often thread-like tips.....*Swietenia*.

Seeds not winged; leaflets never with long slender tips.

Ovules several in each cell of the ovary, 2-seriate; capsule dehiscent from the base upward.....*Carapa*.

Ovules 1-2 in each cell of the ovary, not 2-seriate; capsule dehiscent from the apex downward.

- Disk tube-like or subcampanulate; leaflets 30 or more *Cabralea*.
 Disk stipe-like or annular; leaflets usually much fewer.
 Anthers borne on the apex of the stamen tube or of its lobes. *Trichilia*.
 Anthers borne inside the apex of the stamen tube *Guarea*.

CABRALEA Jussieu

Trees or shrubs; leaves alternate, odd-pinnate or even-pinnate, the leaflets entire, often oblique at the base; flowers small, perfect, in axillary panicles; sepals 5, imbricate; petals 5, free, imbricate in bud; stamen tube cylindric, 10-crenate, the teeth 2-cleft or entire; anthers 10, alternate with the teeth; disk tube-like or subcampanulate; ovary 3-5-celled, the style slender, erect, the stigma disk-like; ovules 1-2 in each cell, superposed, pendulous; capsule coriaceous or ligneous, indehiscent, loculicidally dehiscent, or opening irregularly at the apex, the cells 1-2-seeded; cotyledons carnose.

About 30 species, in tropical America, chiefly in Brazil. Only one is known from North America.

Cabralea insignis C. DC. in Donn. Smith, Bot. Gaz. 19: 1. 1894. *Palo de zorro*.

Moist forest of the Pacific slope, 900-1,500 meters; endemic; Sacatepéquez (type from Acatepeque, *J. D. Smith* 2570; collected also below Las Lajas); Chimaltenango; Sololá; Quezaltenango.

A large shrub or small tree; leaves even-pinnate, large, the petiole and rachis slender, terete, pilose; leaflets as many as 19 pairs or fewer, opposite, sessile and almost clasping, membranaceous, very narrowly oblong, 10-17 cm. long, 2-3 cm. wide, acute or acuminate, obliquely rounded at the base, glabrous above or nearly so, lustrous, the veins prominulous, pilose beneath on the costa, with prominent reticulate venation; capsule indehiscent, 3.5 cm. in diameter, brown, glabrous, the cells 1-seeded; seeds ellipsoid, 18-22 mm. long, 12-15 mm. broad; cotyledons carnose, elliptic.

Flowers of this plant are unknown, and its true generic position is therefore not well established. Two recent collections are sterile, but the tree may be easily recognized by its distinctive foliage.

CARAPA Aublet

Trees; leaves alternate, even-pinnate or odd-pinnate, the leaflets entire, usually coriaceous; flowers small, perfect, in terminal or axillary panicles; calyx 4-5-lobate or of 4-5 imbricate sepals; petals 4-5, free, reflexed, alternate with the sepals; stamen tube cupular or ovoid, 8-10-lobate, the lobes cleft or entire; anthers 8-10, sessile within the tube at the base of the sinuses; disk annular, carnose; ovary 4-5-celled, 4-5-sulcate, sessile, the style short, the stigma disk-like; ovules 4-8 in each cell, biseriate; fruit a large capsule, 1-5-celled, subglobose or ovoid,

ligneous or carnose, the cells 2-5-seeded; seeds large, angulate, without endosperm, the testa corky; radicle lateral.

About 10 species, in tropical America and West Africa. Three have been reported or described from Central America, the status of two of them still somewhat dubious.

Carapa guianensis Aubl. Pl. Guian. Suppl. 32. *pl.* 387. 1775.

Stream banks or often in *Manicaria* swamps, at sea level; Izabal. British Honduras; Honduras; West Indies; northern South America to the Amazon Valley.

A large tree, glabrous almost throughout; leaves very large, long-petiolate, the petiole and rachis terete; leaflets mostly 10-14, opposite or subopposite, petiolulate, coriaceous, oblong to oblong-elliptic, mostly 15-25 cm. long and 6-10 cm. wide, acute or obtuse and mucronate at the apex, subacute to rounded at the base, somewhat lustrous above, slightly paler beneath; panicles axillary, glabrous, the branches 20-40 cm. long or more, the flowers sessile or nearly so; sepals 4, semiorbicular, glabrous, the 2 inner ones larger; petals 4, broadly obovate to elliptic, 5-5.5 mm. long, obtuse or rounded at the apex, glabrous; stamen tube cupular; ovary 4-celled, glabrous; fruit obtusely 4-angulate, 7-10 cm. broad.

Called "bastard mahogany" in British Honduras. In South America this tree is said to attain a height of 50 meters and a trunk diameter of 2 meters, but in Central America it is usually much smaller. The smooth, pale brown, angular seeds are as large as those of a horse-chestnut (*Aesculus*), and rich in oil, which in South America is used for soap-making and illumination. It is said that in some regions people anoint themselves with it to keep away mosquitoes. The bark is sometimes utilized for tanning and is reported to contain an alkaloid, carapine. The wood is reddish brown, often dark and dull, the sapwood oatmeal color; without distinctive taste or odor; rather hard and compact, with a specific gravity of 0.60-0.75; mostly straight-grained, uniform in texture, rather coarse; works readily, finishes smoothly, takes paint and glue well, is durable. In northern South America it is much used for furniture and house construction, masts and spars, shingles, and miscellaneous purposes. The most usual English name is "crabwood." Some lumber has been exported from South America to the United States under the name "andiroba," or sometimes as British Guiana, Demerara, or Brazilian mahogany.

CEDRELA L. Spanish cedar

Trees; leaves large, usually even-pinnate, the leaflets numerous, opposite or subopposite; flowers perfect, in terminal or subterminal panicles, small, whitish;

calyx 4 5-lobate; petals 4-5, erect, carinate to the middle or lower on the inner face, the keel adherent to the disk; disk thick or elevated and columnar, 4-6-lobate; stamens 4 6, free, inserted on the edge of the disk, sometimes alternating with staminodia, the filaments subulate, the anthers versatile; ovary 5-celled, sessile on the disk, the style filiform, the stigma discoid, often 5-lobate; ovules 8-12 in each cell, biseriate, pendulous; fruit capsular, 5-celled, 5-valvate, coriaceous, septicidally dehiscent from the apex almost to the base, the valves separating from a persistent 5-winged axis; seeds samaroid, imbricate downward in 2 rows in each cell, expanded at the apex into a chartaceous wing; endosperm carnose; embryo straight, the cotyledons plane, subfoliaceous, the radicle short.

Species about 15, in tropical America, most of them Mexican. In Central America two other species are known from Costa Rica and Panama.

Leaves odd-pinnate, the leaflets subsessile

C. imparipinnata.

Leaves even-pinnate, the leaflets sessile or long-petiolulate.

Petiolules mostly 8 25 mm. long.

Petiolules usually about 1 cm. long

C. mexicana.

Petiolules 2-2.5 cm. long .

C. longipes.

Petiolules all or mostly 4 mm. long or shorter.

Leaflets densely and softly pilose beneath or when young very densely tomentose; capsule 8 cm. long or even larger

C. salvadorensis.

Leaflets glabrate beneath except when very young, the pubescence sparse and inconspicuous; capsule 2.5 4 cm. long .

C. pacayana.

***Cedrela imparipinnata* C. DC. in Donn. Smith, Bot. Gaz. 19: 4. 1894.**

Known only from the type, collected on Volcán de Fuego, Sacatepéquez, 1,800 meters, *J. D. Smith* 2571.

Young branchlets puberulent, soon glabrate; leaves long-petiolate, odd-pinnate, with 3-5 pairs of lateral leaflets; leaflets subsessile, lanceolate, the largest 8 cm. long and 3 cm. wide, acutely acuminate, subequal at the base and acute, puberulent on the rachis; capsule oblong, glabrous, 4-valvate, 5 cm. long, the valves 12 mm. wide; seeds with the wing 3 cm. long.

***Cedrela longipes* Blake, Contr. U. S. Nat. Herb. 24: 9. 1922.**
Cedro.

Type from El Paraíso, Dept. Copán, Honduras, and to be expected in adjacent Guatemala.

A tree 30 meters tall with a trunk 80 cm. in diameter, the branchlets glabrous; petiolules slender, 2-2.5 cm. long; leaflets 8 10, alternate or subopposite, chartaceous, obliquely ovate or lance-ovate, 10-12 cm. long, 3.5-4.5 cm. wide, long-acuminate, unequally rounded at the base, glabrous, lustrous above, paler beneath; panicles 20 cm. long or larger, glabrous, the branches spreading at right angles; calyx 3.5-4 mm. wide, the teeth irregular, deltoid, subobtuse; petals oblong, 7.5 mm. long, densely puberulent outside; ovary glabrous.

The wood is exploited locally for furniture and house-building.

Cedrela mexicana M. Roem. Syn. Monogr. 1: 137. 1846. *C. yucatanana* Blake, Proc. Biol. Soc. Wash. 33: 110. 1920. *Cedro*; *Cuché* (Petén, Maya); *Yoxcha* (Huehuetenango fide Tejada; perhaps some other species); *Tioxché* (Quiché fide Tejada; species uncertain).

Dense or open forest, chiefly at 600 meters or less but sometimes at higher elevations, often growing along roadsides; frequently planted about dwellings; Petén; Alta Verapaz; Baja Verapaz (species uncertain); Izabal (perhaps some other species); Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos. Southern Mexico; British Honduras to Salvador and Panama; West Indies; northern South America.

A tree of medium or large size, often 20–30 meters high, the trunk often more than a meter in diameter, usually with narrow buttresses, the bark light or medium brown, with coarse vertical fissures, the inner bark pinkish; leaves large, even-pinnate, the petiolules mostly 8–10 mm. long, slender; leaflets usually 10–30, chiefly opposite, obliquely lanceolate, commonly 7–13 cm. long and 2.5–4.5 cm. wide, long-acuminate, at the base broadly rounded on one side and acute on the other, glabrous or nearly so, sometimes puberulent beneath on the veins; panicles 30–35 cm. long or larger, open and lax, the branches glabrous or puberulent, the pedicels 1–2 mm. long; calyx sparsely puberulent, the lobes acute; petals oblong, 5–6 mm. long, acute or obtuse, velutinous-puberulent, whitish; filaments glabrous; capsule oblong-ellipsoid, about 4 cm. long; seeds with the wing 12–20 mm. long and 5–6 mm. wide.

Sometimes called “cedro real” in Salvador; “culche” (Yucatan, Maya); “cedro colorado” (Yucatan). This is one of the two or three most important timber trees of Central America and specifically of Guatemala, in importance perhaps second only to mahogany and highly esteemed since ancient times for construction purposes. The Guatemalan species are poorly represented by herbarium material—as is the case also for other regions—principally because the trees are so large that it is difficult to obtain specimens and also because it is hard to find trees in proper condition for collecting.

The ranges of the species within Guatemala can not be stated definitely, and the notes given here relate to the genus as a whole. As a matter of fact, probably the woods of all species are approximately equal in quality, and locally no distinction is made between them. Cedro trees are common through most of the lowlands, in some places forming a substantial part of the forest, especially along the Pacific plains and foothills. Their numbers have been greatly reduced in recent years by intensive lumbering operations. In the lower parts of Alta Verapaz the trees are plentiful, and many are planted and thriving in the *fincas* of that department. They are numerous also on the drier sides of the mountains in Baja Verapaz

and fairly common in the wet forest of Izabal. *Cedrela* trees are most numerous on the Pacific slope, chiefly on the plains and in the foothills. We have noted them growing as high as Zunil in Quezaltenango (about 2,400 meters). There are many huge trees in the coffee *fincas* of the lowlands of Quezaltenango, as well as in Retalhuleu, Suchitepéquez, and San Marcos. The cedros make handsome shade trees, and many are planted for shade as well as for lumber.

The wood is red or reddish, pinkish, light purplish, or light reddish brown, the sapwood pinkish, grayish, or almost white; odor and taste cedar-like; variable from very light and soft to fairly heavy and firm, the specific gravity 0.37-0.72; usually straight-grained, variable in texture, easy to work, finishes smoothly, holds its shape, is durable. The Spanish name "cedro" signifies "cedar," and was given because of the cedar-like fragrance of the wood. The usual English name is "Spanish cedar." The odor is due to a volatile oil in the wood. It is easy to become acquainted with Spanish cedar, since practically all the characteristically fragrant cigar boxes are made from it. In Guatemala the wood is used for carpentry and construction of all kinds, and is especially valued because of its resistance to insect attacks. About 10,000,000 board feet of the wood are used in the United States every year, but nowhere, apparently, has any significant attempt been made to replace the supply that is being rapidly exhausted, and this in spite of the fact that the tree grows easily and rapidly. The various species are more widely distributed than any other important lumber tree of tropical America, from Mexico to Argentina.

By the lowland Indians, cedar wood has always been highly esteemed for making canoes and paddles. In Guatemala a very large part of the household furniture is made from it, and it is employed for almost every purpose for which wood is utilized. "El Cedro," "Los Cedros," and "Cedral" are some of the local geographic names referring to cedro trees. The bitter bark is used in some localities as a febrifuge and tonic, and an infusion of it is used in treating eruptions in the mouth. Reports of *Cedrela fissilis* Vell. from Guatemala probably relate to *C. mexicana*. The Central American trees often have been referred to as *C. odorata* L., a species of the West Indies and South America, unknown in Central America.

Cedrela pacayana Harms, Notizbl. Bot. Gart. Berlin 11: 784. 1933. *Cedro*; *Cedrillo*; *Setún* (San Marcos).

Moist or rather dry forest, often growing along roadsides, 1,000–2,500 meters; as far as known, endemic; El Progreso; Jalapa; Jutiapa; Guatemala (type from Volcán de Pacaya, Los Cachiflanes, *A. Tonduz* 445; collected also at San Juan Sacatepéquez); Sacatepéquez; Chimaltenango; Suchitepéquez; Huehuetenango; Quezaltenango; San Marcos.

A large tree, often 20 meters high or larger, often with a broad crown, the young branchlets puberulent or almost glabrous; leaves often very large, especially on young plants when sometimes a meter long, the rachis puberulent or glabrate; leaflets mostly 7–9 pairs but sometimes more numerous, sessile or short-petiolulate, lance-oblong to oblong or ovate-oblong, mostly 9–15 cm. long and 4–6 cm. wide, acuminate, obliquely rounded at the base or obtuse, chartaceous, green and glabrate above, slightly paler beneath and minutely puberulent, often densely so, sometimes glabrate; panicles large, densely puberulent, the branches often reflexed; calyx irregularly 5-dentate, 2–2.5 mm. high, puberulent, the teeth broadly deltoid, acute or obtuse; petals villous, 8 mm. long; filaments glabrous; ovary glabrous; capsule unknown.

The species is of rather doubtful standing, and must be studied in comparison with the Mexican *C. oaxacensis* C. DC. & Rose and *C. saxatilis* Rose, to which it is closely related. The available material is insufficient for study, one collection from San Juan Sacatepéquez being certainly referable to *C. pacayana*, the others of doubtful identity. It is quite probable that some or perhaps all the Guatemalan collections are to be referred ultimately to *C. oaxacensis*, from which *C. saxatilis* is none too distinct. In the regions of Guatemala and Antigua this tree is frequently planted as living fence-posts. Wild trees are abundant along the Río Guacalate above Antigua. In the late evening they have a peculiar light-colored appearance that makes them easy to recognize from a long distance. This species is in cultivation in the Jardín Botánico of Guatemala.

Cedrela salvadorensis Standl. Field Mus. Bot. 4: 215. 1929.

Moist forested ravines, 1,800 meters; Chimaltenango (Quisaché, *Standley* 62044). Salvador, the type collected near Chalchuapa.

A tree; petiole and rachis slender, tomentose; leaflets 7–8 pairs or more, opposite, sessile or nearly so, ovate-oblong or lance-oblong, 8–18 cm. long, 3.5–5 cm. wide, the lower ones often oval or oval-ovate, rather abruptly acuminate or long-acuminate, broadly rounded at the base, puberulent or hirtellous above on the nerves or almost glabrous, beneath densely velutinous-pilose or when young very densely fulvous-tomentose, the lateral nerves about 17 pairs; panicles apparently small, the branches spreading, puberulent; calyx campanulate, 2 mm. long, truncate or obscurely denticulate, sparsely puberulent; petals 6 mm. long, very densely tomentose outside with yellowish white, appressed hairs; capsule obovoid or oblong-obovoid, 8–9.5 cm. long, often coarsely tuberculate, the valves very

thick and woody, 2.5 cm. wide; seeds with the wing almost 4 cm. long, the very thin wing as much as 13 mm. wide.

Called "cedro macho" in Salvador. The species is noteworthy for the huge capsules, much larger than those of any other species.

GUAREA L.

Shrubs or trees; leaves even-pinnate or rarely odd-pinnate, the leaflets opposite, subopposite, or alternate, entire, often with pellucid lines or dots; inflorescences axillary or lateral, the flowers perfect; calyx saucer-shaped or cupular, 4-5-dentate or of 4-5 distinct sepals; petals 4-5; stamen tube cylindric or urceolate, entire or shallowly 8-12-lobate; anthers 8-12, included or slightly exerted; disk obsolete or stipe-like; ovary 4-5-celled, the style erect, the stigma discoid; ovules 1 in each cell, or 2 and superposed; fruit capsular, coriaceous or ligneous, 3-5-celled, 3-5-valvate, loculicidally dehiscent from the apex, the valves separable into 2 layers; seeds 1-2 in each cell, arillate, the testa coriaceous or membranaceous; cotyledons carnose, the radicle lateral.

Species 80 or more, in tropical America and West Africa. Several additional Central American species are known from Costa Rica and Panama.

Leaflets conspicuously barbate beneath in the axils of the nerves, or sometimes densely pilose over the whole surface.

Ovary and capsule densely velutinous-pilose; leaflets densely velutinous-pilose beneath.....*G. Tonduzii*.

Ovary and capsule glabrous; leaflets usually glabrous beneath or nearly so, at least in age.

Stamen tube 2-3 mm. high; petals 3.5-5 mm. long.....*G. excelsa*.

Stamen tube 4-5.5 mm. long; petals 5-6 mm. long....*G. Tuerckheimii*.

Leaflets not barbate beneath in the nerve axils, never densely pilose, usually glabrous or nearly so.

Ovary glabrous.

Leaflets mostly 2-3.5 cm. wide, usually 6-12.....*G. Luxii*.

Leaflets mostly 5-10 cm. wide, commonly 4-6.

Petals 6-9 mm. long, strigillose or tomentulose outside.....*G. bijuga*.

Petals 3.5 mm. long, glabrous.....*G. Cook-Griggsii*.

Ovary pilose or tomentose, the hairs usually persistent on the capsule.

Petals about 6 mm. long.....*G. chirriactensis*.

Petals 10-13 mm. long.

Branches of the panicle minutely and densely puberulent....*G. Chichon*.

Branches of the panicle hirsute or hirtellous.....*G. Trompillo*.

Guarea bijuga C. DC. in DC. Monogr. Phan. 1: 567. 1878 (type collected in Guatemala by Skinner). (?) *G. Kegelii* Turcz. Bull. Soc. Nat. Moscou 36, pt. 1: 589. 1863 (type from Guatemala, the locality not known, *Kegel* 12707). *G. Matudai* Lundell, Lloydia 2: 93. 1939 (type from Mount Madre Vieja, Chiapas). *Cola de pava*.

Moist mixed mountain forest, 300-2,700 meters; Santa Rosa(?); Sacatepéquez; Suchitepéquez; Quezaltenango; San Marcos; Quiché. Chiapas.

A small to rather large tree, sometimes 15 meters high with a trunk 30 cm. or more in diameter, the branchlets glabrous or puberulent, often conspicuously lenticellate; leaflets usually 6, rarely more numerous, often coriaceous, oblong-elliptic to elliptic, mostly 18-25 cm. long and 8-12 cm. wide, acute or short-acuminate, often abruptly so, acute at the base, petiolulate, glabrous, the venation prominent and reticulate beneath, the nerves usually stout and elevated; panicles small or large, the branches stout, densely flowered, appressed-pilose or glabrate, the flowers short-pedicellate; calyx 4-dentate, the teeth deltoid, acute, sparsely puberulent; petals oblong, 6-9 mm. long, sparsely pubescent near the apex or throughout; stamen tube glabrous or sparsely pilose, 8-dentate; ovary glabrous, 4-celled; capsule depressed-globose and somewhat 4-gonous, dark ferruginous, 1.5-4 cm. broad, conspicuously pale-lenticellate.

The description of *G. Kegelii* is so brief that the identity of the plant described remains uncertain, which is unfortunate, since the name probably is a valid one, antedating most species described from Central America.

Guarea Chichon C. DC. Ann. Cons. Jard. Bot. Genève 10: 147. 1907.

Moist or wet forest, 350 meters or less; Alta Verapaz (Cubilgüitz); Izabal(?). Tabasco, whence the type; British Honduras; Honduras(?).

A tree attaining a height of 15 meters or more, the trunk sometimes almost a meter in diameter; leaves very large, the leaflets usually 10-12, petiolulate, oblong to oblong-elliptic, 19-30 cm. long, 7-11 cm. wide, subacute or obtusely short-pointed, acute at the base, glabrous, with numerous pellucid dots and lines; panicles small and almost simple or often large and much branched, densely and minutely puberulent, the flowers on thick, short or somewhat elongate pedicels; calyx campanulate, 5-6 mm. broad, densely fulvous-puberulent, the teeth rounded or very obtuse; petals 10-13 mm. long, very densely fulvous-sericeous; stamen tube columnar, puberulent; ovary densely appressed-pilose, 5-celled, sessile.

Called "carbón" and "wild akee" in British Honduras; "chichón" (Tabasco). The Indian name "sopia" is recorded from Honduras for this or a closely related species.

Guarea chirriactensis Standl. & Steyerl. Field Mus. Bot. 23: 167. 1944. *Cuajalote* (perhaps an erroneous name).

Moist or wet, mixed forest, 300-900 meters; endemic; Alta Verapaz (type collected between Chirriacté and Semococh, *Steyermark* 46355; also at Cubilgüitz).

A tree of 18 meters, the branchlets thick, densely lenticellate, densely appressed-pilous, glabrate in age; leaves large, 6-foliolate, long-petiolate, the rachis and petiole sparsely pilous or almost glabrous, the stout petioles 5–8 mm. long; leaflets membranaceous, oblong-ovate or elliptic-oblong, 11–26 cm. long, 6–12 cm. wide, obtuse or rounded at the apex and abruptly and shortly apiculate-acuminate, obtuse or almost rounded at the base and abruptly and shortly contracted, glabrate on both surfaces, usually somewhat pubescent above along the costa, not barbate in the nerve axils, the costa subimpressed above, strongly elevated beneath; panicles axillary, sessile, much branched throughout, scarcely equaling the petioles, about 8–9 cm. long, the branches stout, sparsely pilous or glabrate, the pedicels glabrate, rather slender or stout, 2–4 mm. long; calyx very broadly and shallowly campanulate, 3.5 mm. broad, 2 mm. high, sparsely strigose, almost truncate at the base, very shallowly dentate, the teeth very broadly rounded and inconspicuous; petals 6 mm. long, broadly oblong, very obtuse, densely strigose outside; stamen tube 3 mm. long or slightly longer, glabrous below, puberulent above; ovary densely sericeous.

Guarea Cook-Griggsii C. DC. *Smithson. Misc. Coll.* 68, no. 6: 2. 1917.

Wet mixed forest, 1,600 meters or less; Alta Verapaz (type from Finca Sepacuité, *O. F. Cook & R. F. Griggs* 408). Probably also in the Atlantic lowlands of Honduras.

A large or medium-sized tree, sometimes 18 meters high or more, the branches glabrous or nearly so; leaves large, long-petiolate, the petiole and rachis puberulent at first but soon glabrate; leaflets usually 6, sometimes perhaps more, short-petiolulate, oblong-elliptic or elliptic, 18–25 cm. long, 8–12 cm. wide, acute or short-acuminate, acute or subobtuse at the base, glabrous, prominently reticulate-veined; inflorescence raceme-like, 9–18 cm. long, the branches puberulent, the flowers short-pedicellate; calyx 2.5–3 mm. broad, puberulent, 4-dentate, the teeth acute; petals oblong, 3.5 mm. long; ovary 4-celled, glabrous, sessile or nearly so; stamen tube cylindric, glabrous, the margin minutely crenulate.

Guarea excelsa HBK. *Nov. Gen. & Sp.* 7: 227. 1825. *G. Palmeri* Rose ex C. DC. *Bot. Gaz.* 19: 39. 1894. *Cedrillo*; *Lobén* (Petén; Maya?); *Carbonero*.

Moist or wet forest or thickets, chiefly at 400 meters or less; Petén; Izabal; Escuintla; Suchitepéquez; Retalhuleu; reported from Sacatepéquez; Huehuetenango. Southern Mexico; British Honduras; Honduras; Costa Rica.

A large shrub or a tree, sometimes 9–15 meters high, the trunk seldom more than 40 cm. in diameter, often buttressed, the bark light brown, fairly smooth or with small scales, the young branches appressed-pilous, soon glabrate; leaves large, the petiole and rachis strigillose when young; leaflets mostly 4–6, sometimes more numerous, rather thin or subcoriaceous, elliptic-ovate to elliptic or oblong-oblanccolate, 6–18 cm. long, 2.5–7 cm. wide, obtuse or abruptly short-acuminate, acute or obtuse at the base and often unequal, glabrous above, barbate beneath in the

nerve axils, elsewhere glabrous or sometimes sparsely pilose, reticulate-veined, the petiolules 1-5 mm. long; panicles 3-4 cm. long or often larger, the branches densely strigillose, the pedicels mostly 1-1.5 mm. long; calyx 2 mm. broad, 4-dentate, strigillose, the teeth deltoid; petals 3.5-5 mm. long, white, puberulent; ovary glabrous; capsule subglobose, commonly 4-celled, or the cells by abortion fewer, generally 1.5-2 cm. broad, bright or dark red, often ferruginous when dry.

Called "cramantee" in British Honduras; "carbón" (Honduras); "bejuco," "bejuco blanco," "bejuco colorado" (Veracruz). The wood of this genus is somewhat like that of mahogany and Spanish cedar, usually reddish brown, streaked with lighter and darker shades; hard, moderately heavy, strong, tough, very durable in contact with the soil. It is much used locally for general construction and for many miscellaneous purposes, such as ax handles. In some parts of Central America it is used in large amounts for charcoal.

Guarea Luxii C. DC. in Donn. Smith, Bot. Gaz. 19: 2. 1894.

Moist thickets or mixed forest, 2,700 meters or less; Santa Rosa (type from Santa Rosa, *Heyde & Lux* 3276); Escuintla; Sacatepéquez; Sololá; Suchitepéquez; Quezaltenango; San Marcos; endemic.

A large shrub or small tree 4-9 meters high, the young branches puberulent; leaves rather small, the petiole and rachis puberulent or glabrate; leaflets usually 6-10, short-petiolulate, chartaceous, elliptic-oblongate to lanceolate, mostly 7-12 cm. long and 2.5-3.5 cm. wide, acute or acuminate, usually with obtuse tip, acute or attenuate at the base, glabrous above, sometimes sparsely pubescent beneath when young, prominently reticulate-veined, usually pale green when dry, minutely pellucid-punctate; panicles mostly small and much shorter than the leaves, not seen in flower; calyx cupular, 4-dentate, hirtellous or puberulent, the teeth acute; petals glabrous; stamen tube glabrous; ovary ovoid, glabrous; fruit globose, red or reddish, 1.5-3 cm. broad, borne on a long stout pedicel.

Guarea Tonduzii C. DC. Smithson. Misc. Coll. 68, no. 6: 4. 1917.

Moist or wet, mixed forest, 1,400-1,700 meters; Quezaltenango; San Marcos. Costa Rica.

A tree of 6-15 meters, the bark smooth or slightly flaky, dark or cinnamon brown, the branchlets densely pilose-tomentose; leaves large, the petiole and rachis densely tomentose or puberulent; leaflets thick, usually 4-12, oblong-elliptic or elliptic, mostly 9-18 cm. long and 4-7 cm. wide, acuminate to rounded at the apex, acute to rounded at the base, at first tomentulose above but in age glabrate, densely velutinous-pilose beneath or at first tomentose, the nerves stout and prominent; panicles short and rather few-flowered, densely fulvous-tomentose, the flowers short-pedicellate, yellowish white; calyx 5 mm. broad, shallowly 4-dentate, densely appressed-pilose, the teeth deltoid, acute; petals 8 mm. long, densely fulvous-pilose; stamen tube ovoid, 8 mm. long, glabrous; capsule about 2 cm. in diameter, densely covered with velvety spreading fulvous hairs.

It is stated that in Costa Rica the fruits are much sought by two kinds of squirrels. The species is easy of recognition because of its densely velvety capsules.

Guarea Trompillo C. DC. Ann. Cons. Jard. Bot. Genève 10: 147. 1907. *Setún* (San Marcos); *Trompillo*; *Cola de pava*.

Moist thickets or mixed forest, 1,300 meters or less, Pacific slope; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu; Quezaltenango (type from San Francisco Miramar, *H. Pittier* 66); San Marcos. Chiapas.

A tree of 10-12 meters, the trunk 45-60 cm. in diameter, the young branchlets, petioles, and leaf rachis hirtellous or pilose, soon glabrate; leaves large, the leaflets 6-12, opposite or subopposite, elliptic-oblong to lance-oblong, mostly 14-18 cm. long and 4-6 cm. wide, minutely pellucid-punctate, short-acuminate or long-acuminate, acute or obtuse at the base, rather thick and firm, glabrous above, often hirtellous beneath on the nerves, glabrate in age; panicles narrow and raceme-like, 40 cm. long or less, the branches hirtellous, the flowers sessile or subsessile; calyx puberulent, the teeth deltoid or rounded; petals 12-13 mm. long, oblong, densely puberulent; stamen tube 8-9 mm. high, glabrous, entire or nearly so; ovary 5-celled, appressed-pilose.

Guarea Tuerckheimii C. DC. in Donn. Smith, Bot. Gaz. 33: 250. 1902.

Type from Cubilgüitz, Alta Verapaz, 350 meters, *Tuerckheim* 7835. Veraacruz; British Honduras.

A tree 10 meters high or less, the trunk to 20 cm. in diameter, the young branches appressed-pilose at first, soon glabrate; petiole and rachis strigillose or finally glabrate; leaflets mostly 4-12, opposite, short-petiolulate, lance-elliptic or lance-oblong, 9-15 cm. long, 4-5 cm. wide, long-acuminate, acute at the base, glabrous above, barbate beneath in the nerve axils; panicles small and narrow, appressed-pilose or strigillose; calyx small and shallow, 4-dentate, appressed-pilosulous; petals oblong, 5-6 mm. long, sparsely strigillose; stamen tube 4-5.5 mm. long, glabrous; ovary glabrous; capsule subglobose, 1.5-2 cm. broad.

Called "wild orange" in British Honduras.

MELIA L. Chinaberry

Trees; leaves alternate, pinnate or bipinnate, the leaflets entire or dentate; flowers perfect, showy, in axillary panicles, purple; sepals 5-6; petals 5-6, distinct, contorted, spreading; stamen tube cylindric, dilated above, 10-12-dentate, each tooth cleft; anthers 10-12, inserted inside the tube near its apex; disk annular; ovary 3-6-celled, the style slender, the stigmas 5-6-lobate; ovules 2 in each cell, superposed; fruit drupaceous, containing a 1-6-celled stone; seeds usually solitary in each cavity, with crustaceous testa; endosperm carnosous; cotyledons foliaceous, the radicle terete, superior.

Species about 10, in the warmer regions of the Old World.

Melia Azedarach L. Sp. Pl. 384. 1753. *Paraíso*.

Native of the Old World, cultivated and naturalized in tropical and warmer parts of America. Cultivated commonly in Guatemala from sea level up to 1,800 meters, and naturalized in many places, especially in hedges or lowland thickets; Petén; Alta Verapaz; Baja Verapaz; Izabal; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Suchitepéquez; Retalhuleu; San Marcos.

A tree, usually 9 meters high or less; young parts often stellate-pilose at first but soon glabrate; leaves large, mostly 2-pinnate, the leaflets lanceolate to oval, 3-8 cm. long, acute to long-acuminate, acute to subcordate at the base, incised-serrate or lobate; panicles 10-25 cm. long, many-flowered, the flowers slender-pedicellate; sepals 2-3 mm. long, lanceolate to ovate; petals 8-12 mm. long, purple or sometimes whitish; stamen tube usually deep purple; ovary glabrous; drupes globose, 1.5-2 cm. in diameter, yellow, smooth, rather translucent, the stone osseous, sulcate.

Called "paradise tree" in British Honduras. In Guatemala the name is given quite as often "paraíso" as "paraiso." The English name "umbrella tree" often is used. The tree is much planted in Guatemala in parks and about dwellings, principally because of its handsome sweet-scented flowers, which remind one of the lilac. It is not a satisfactory shade tree because the branches are brittle and easily pulled from the trunk, but it withstands neglect and mistreatment for a long time. The large clusters of yellowish fruits hang on the tree for many months. The large "seeds" are used for making necklaces and bracelets. The fruit is generally reputed to be poisonous to human beings. The bark is said to have been used in some regions for stupefying fish. It is claimed that a decoction of the fruits sprinkled over growing plants will protect them from the attacks of cutworms and other noxious insects. The specific name, *Azedarach*, is of Arabic origin. Being easily spread by seeds, it is likely that soon after the conquest the tree was introduced into Mexico and Central America from the Iberian Peninsula.

SWIETENIA Jacquin. Mahogany

Large trees; leaves alternate, even-pinnate, rarely odd-pinnate, the leaflets opposite, petiolulate, unequal at the base, entire; flowers small, whitish, in axillary or subterminal panicles; calyx small, 5-lobate, rarely 4-lobate, the lobes imbricate; petals 5, free, contorted, spreading; stamen tube urceolate or cylindric-urceolate, 10-dentate; anthers 10, inserted below the sinuses of the tube, included; disk saucer-shaped or shallowly cupular, sulcate, the margin crenate; ovary usually 5-celled, sessile in the disk, the style columnar, the stigma discoid; ovules numerous in each cell, pendulous; fruit capsular, large, normally 5-celled, 5-valvate, ligneous,

usually septicidally dehiscent from the base, the valves separating into 2 layers, from a stout persistent 5-winged central axis; seeds 10-14 in each cavity, samaroid, imbricate downward in 2 series in each cell, expanded apically into a long chartaceous wing; endosperm thin, carnosé; embryo transverse, the cotyledons large, the radicle short.

A genus of probably 3 species, one in the West Indies and southern Florida; one along the relatively dry Pacific coast of Mexico and Central America; and a third, of wide range, along the Atlantic coast of Mexico and Central America, and south to the Amazon Valley of Brazil and Peru. Originally all the trees were referred to a single species, *S. Mahagoni* (L.) Jacq., now known to be restricted to Florida and the West Indies. In recent years several species have been described from South America, but it is believed they are mere forms of *S. macrophylla*.

Leaflets sessile or nearly so, usually tapering to a very slender and often thread-like, elongate tip *S. humilis*.

Leaflets slender-petiolulate, acute or acuminate *S. macrophylla*.

Swietenia humilis Zuccarini, Abh. Akad. Muenchen 2: 355. 1837 (type from Isthmus of Tehuantepec, Oaxaca). *S. cirrhata* Blake, Journ. Wash. Acad. Sci. 10: 292. 1920 (type from Michoacán, Mexico). *Caoba*.

Moist or rather dry forest, chiefly in the Pacific plains or foothills, mostly at 400 meters or less, but occurring sporadically elsewhere; Chiquimula (near Chiquimula, 400 meters; wild?); Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu; San Marcos; Huehuetenango (region of Nentón, near Santa Ana Huista, 800-1,200 meters). Western and southern Mexico; Salvador; Nicaragua; Costa Rica.

A medium-sized or sometimes large tree; leaves smaller than in *S. macrophylla*, the leaflets mostly 6-12, lanceolate or narrowly lanceolate, sometimes lance-ovate, 6-15 cm. long, 1.5-5 cm. wide, tapering at the apex into a very long and slender, often thread-like tip, acute to rounded at the base, sessile or nearly so, subcoriaceous, glabrous; panicles 5-20 cm. long or larger, many-flowered, with slender spreading branches; calyx 2.5 mm. broad, the lobes deltoid or rounded, apiculate; petals obovate, white, 4.5-6 mm. long; stamen tube glabrous, the teeth deltoid-ovate; ovary glabrous; capsule ovoid, often 15-20 cm. long and 10-12 cm. broad, umbonate; seeds 6-8 cm. long, light brown.

The name "caoba," used generally in Spanish-speaking regions, is of Antillean origin, as is probably also the English name, "mahogany." Mahogany formerly was abundant in the Pacific lowlands, much of it being exported and also used locally for almost every conceivable purpose. Although various sawmills still are engaged

in working it, the supply has greatly diminished. There are laws ordering its replanting wherever cut, but these are seldom obeyed, apparently, except by a few of the most advanced landowners. One proprietor has made extensive plantings in the plains and foothills of Escuintla, but his example has been little followed. He estimates that trees are ready for cutting about 40 years after planting.

Mahogany is the most valuable timber tree of tropical America, also the most celebrated, and the wood has long been used as a standard for the comparison of other fine woods. Acquaintance with it was made by the Spaniards at the time of the discovery, and it was used by Cortés and others for building the ships on which they embarked on further voyages of discovery. The wood is noted for richness of coloring, which is enhanced by time, deep luster, beauty of grain, and variety of figure and mottling. It seasons readily without serious shrinkage, checking, or warping, is little affected by atmospheric changes, is very durable, and is useful in either solid form or as veneers. It is perhaps most highly prized for furniture and cabinetwork, but is valued also in shipbuilding, and in Central America it is utilized for the most ordinary purposes, even, at least in the past, for railway crossties and for fencing. Many dugout canoes formerly were made from it. Oil from the seeds was used by the ancient Mexicans as a cosmetic and is said to have been employed in Mexico in soap manufacture. A handsome board of this mahogany, grown in Guatemala, is on exhibition in one of the halls of Chicago Natural History Museum, to which it was presented by Mr. L. Lind Petersen of Finca Zapote, Escuintla.

Swietenia macrophylla G. King in Hook. Icon. pl. 1550. 1886. *S. belizensis* Lundell, Contr. Univ. Mich. Herb. 6: 36. 1941 (type from Big Eddy Ridge, Stann Creek Valley, British Honduras, *Gentle* 3541). *Caoba*; *Chacalte* (Petén, Maya).

Scattered in wet, lowland or hillside, mixed forest, mostly at 400 meters or less; Petén; Alta Verapaz; Izabal. Oaxaca and Veracruz to Chiapas and Tabasco; British Honduras, along the Atlantic coast to Panama, and probably southward locally to the Amazon Valley of Brazil and Peru.

A tall tree, often 35–45 meters high, the trunk clear of limbs for 18–20 meters, the trunk 75–150 cm. in diameter; buttresses sometimes 3.5–4.5 meters high; bark dark reddish brown, deeply fissured, the inner bark pinkish brown; branchlets glabrous; leaves large, petiolate, glabrous; leaflets mostly 8–12, slender-petiolulate, obliquely lanceolate, usually 8–15 cm. long and 2.5–7 cm. wide, acuminate to

long-acuminate, acute and very oblique at the base; panicles 10–20 cm. long or larger, glabrous; calyx 2–2.5 mm. broad, the lobes short, rounded; petals obovate, white, 5–6 mm. long; stamen tube cylindric, with acute or acuminate teeth; capsule ovoid, commonly 12–15 cm. long and 7 cm. broad, pointed at the apex; seeds 7.5–8.5 cm. long, the reddish brown wing as much as 3 cm. wide.

The Maya name is reported from British Honduras as “chiculte,” and as “punab” from Yucatan. A *caserío* of Alta Verapaz has been given the name of La Caoba. This species was reported from Guatemala by Hemsley as *S. Mahogani* L. It is reported as plentiful in many sections of the three departments from which it is known, growing, however, as isolated trees here and there in the forest. Logwood and this species of mahogany have been of great importance in the history of Central America, for it was because of their occurrence and exploitation that the British colony of Belize was established. English woodcutters established settlements there in the seventeenth century, and by the end of that century a thriving industry had been established at Belize. It is sometimes remarked facetiously that the town of Belize is built upon the site of a former swamp now filled with mahogany chips and gin bottles. Vast quantities of mahogany have been exported from Belize, much of it originating inland in Guatemala and Mexico. Its export is still one of the most important industries of the colony.

The wood of this species is generally known by the name “Honduras mahogany.” The highly figured wood is known in Guatemala by the name “caoba caracolillo.” The name *Swietenia belizensis* was given to a form known locally as “broken ridge mahogany.” *S. macrophylla* is at present by far the most important commercially of all members of the genus, and it has a vast range. It is believed that the several species described during the past few years from South America are no more than forms of *S. macrophylla* if, indeed, they differ in any respect whatever from it. Good herbarium specimens, except of the West Indian species, accumulate very slowly, and these recent species have been based on characters that doubtless will be found worthless when ample material is brought together for comparison. Supposed geographic isolation has probably been the prime cause for the description of all or most of them. A decoction of the bitter bark of mahogany is employed by the Indians of Alta Verapaz in treating intermittent fevers.

TRICHILIA L.

Trees or shrubs, glabrous or pubescent; leaves alternate, mostly odd-pinnate, sometimes even-pinnate, digitate, or 1-foliate; leaflets opposite or alternate,

entire in the Central American species, often pellucid-punctate; flowers small, whitish or yellowish, in axillary or terminal panicles or cymes; calyx cupular, 4-5-lobate, rarely of 5 distinct or almost distinct sepals; petals 4-5, rarely 3, free or connate at the base, erect or spreading, imbricate or valvate; stamens 4-10, usually 8 or 10; filaments broadly winged, more or less united into a tube; anthers inserted at the base of the sinuses or at the apex of the filaments, erect, exserted; disk annular, free or adnate to the ovary or stamen tube; ovary 2-3-celled, more or less immersed in the disk, sometimes short-stipitate; style short or elongate, the stigma capitate, 2-3-lobate; ovules 2 in each cell, collateral or superposed, sometimes solitary; fruit capsular, 2-3-celled, 2-3-valvate, loculicidally dehiscent from the apex, the seeds 1-2 in each cell, subtended by a fleshy aril, this often brightly colored; seeds inverted, the testa coriaceous; cotyledons carnosae, the radicle superior.

About 200 species, in tropical America and Africa. In southern Central America several additional species are known.

Leaves 1-foliolate, or pinnately or digitately 3-foliolate.

Leaves 1-foliolate.....*T. breviflora*.

Leaves 3-foliolate.

Leaves digitately 3-foliolate, the leaflets rounded at the apex*T. trifolia*.

Leaves pinnately 3-foliolate, the leaflets acuminate.....*T. privigna*.

Leaves pinnate, with 5 or more leaflets.

Ovary and capsule glabrous.

Leaflets glabrous beneath.....*T. havanensis*.

Leaflets densely velutinous-pilose beneath.....*T. Oerstediana*.

Ovary pubescent, the capsule usually conspicuously pubescent, sometimes glabrate.

Flowers minute, scarcely 2 mm. long; leaflets small, mostly 2.5-7 cm. long.

T. minutiflora.

Flowers larger, 3 mm. long or more; leaflets usually larger.

Leaflets hirtellous or pilose beneath, at least on the costa and nerves and often densely pilose over the whole surface.

Inflorescences small, sessile, branching from the base, much shorter than the petioles; leaflets usually 5.....*T. montana*.

Inflorescences often large, long-pedunculate, frequently equaling or exceeding the petioles; leaflets usually more than 5.

Fruit oblong, much longer than broad; leaflets broadest at or below the middle.....*T. erythrocarpa*.

Fruit subglobose, about as broad as long.

Leaflets usually broadest above the middle, densely velutinous-pilose beneath, obtuse or obtusely short-acuminate.*T. cuneata*.

Leaflets broadest at or below the middle, sparsely hirsute or pilose beneath or often glabrate, acuminate.....*T. hirta*.

Leaflets glabrous beneath or merely puberulent, sometimes barbate in the nerve axils.

Inflorescences small, much shorter than the petioles, branched from the base; leaflets mostly 5.....*T. montana*.

Inflorescences larger, usually pedunculate and often long-pedunculate, often equaling or exceeding the petioles; leaflets usually more than 5.

Petals glabrous outside except near the apex, or hirtellous with spreading hairs.....*T. hirta*.

Petals densely pilose outside with minute appressed hairs.

Filaments distinct to or below the middle.....*T. acutanthera*.

Filaments united to the apex to form a tube.

Calyx tube glabrous; inflorescences mostly little if at all exceeding the petioles.....*T. moschata*.

Calyx tube pubescent; inflorescences much longer than the petioles, often about equaling the leaves.....*T. Matudai*.

Trichilia acutanthera C. DC. Bull. Herb. Boiss. II. 5: 422. 1905. *T. izabalana* Blake, Contr. U. S. Nat. Herb. 24: 10. 1922 (type from Río Mosina, Izabal, *S. F. Blake* 7863). *Carbón; Carboncillo; Cola de pavo*.

Wet forest, often in wooded swamps or along streams, at or little above sea level, or on the Pacific slope ascending to 1,400 meters; Alta Verapaz; Izabal; Escuintla; Retalhuleu; Quezaltenango; Huehuetenango. Tabasco; British Honduras; Honduras; Costa Rica.

A tall tree, sometimes 35 meters high with a trunk 50-90 cm. in diameter, the trunk tall and straight, the young branchlets puberulent, soon glabrate; leaves large, generally odd-pinnate, the rachis and petiole puberulent; leaflets usually 7-9, alternate or subopposite, short-petiolulate, firm-membranaceous, oblong-oblanceolate to elliptic-obovate, mostly 12-15 cm. long and 4-5.5 cm. wide, shortly obtuse-acuminate, cuneately narrowed to the acute or obtuse base, often fuscous when dried, glabrous above, when young sparsely puberulent beneath but in age glabrous or nearly so, obscurely pellucid-punctate; panicles axillary, mostly 5-12 cm. long, sometimes larger, the branches puberulent or strigillose, the flowers pedicellate; calyx deeply 5-lobate, the lobes triangular-ovate, strigillose outside; petals 5, oblong-elliptic, whitish or pale yellow, acute or subacute, strigillose outside, 3-3.5 mm. long; lobes of the stamen tube truncate at the apex, hirsute; anthers hirsute; ovary hirsute, the style short, glabrous; capsule broadly ovoid, 1 cm. long, densely ferruginous-tomentulose.

The available material from Costa Rica, the type region, is scant, and there is some possibility, although little apparent probability, that *T. izabalana* may be a distinct species. Although attaining under favorable conditions such a great size, this species often flowers when only a shrub of 2-4 meters.

Trichilia breviflora Blake & Standl. Field Mus. Bot. 4: 216. 1929.

Moist or wet, mixed forest, 500 meters or less; Alta Verapaz (Río Semococh; Río Icvolay). Atlantic coast of Honduras, the type from Tela.

A shrub or tree of 3-10 meters, the branches slender, sordid-puberulent when young; leaves 1-foliolate, the slender petiole 1-2 cm. long, the petiolule 2-4 mm. long; leaflets oblong to broadly elliptic or oblong-obovate, 8-14 cm. long, 3.5-7 cm. wide, broad at the apex and abruptly acuminate or short-acuminate, acute or subacute at the base, thick-membranaceous, green above, sparsely puberulent along the costa, brownish and somewhat paler beneath, sparsely puberulent on the nerves, the lateral nerves slender, 10-12 pairs, arcuate, prominent beneath; panicles axillary and terminal, 2.5-5.5 cm. long, many-flowered, long-pedunculate, the branches sparsely puberulent, the flowers short-pedicellate, greenish white; calyx strigillose, 0.7 mm. long, the 4-5 teeth short, broadly deltoid, subacute; petals 4-5, sparsely strigillose above, 1.5 mm. long; anthers obtuse, glabrous, 0.7 mm. long; ovary densely hispidulous, 2-celled, the ovules 2, collateral; style very short, glabrous; seeds black and shining, about 14 mm. long, the aril red.

Trichilia cuneata Radlk. Sitzungsber. Akad. Muenchen 9: 642. 1879 (type said to be from Guatemala, *Friedrichsthal*; a photograph of the type is in the Herbarium of Chicago Museum, but the label was not photographed, and the place of collection is unknown). *T. Heydeana* C. DC. in Donn. Smith, Bot. Gaz. 19: 3. 1894 (type from Naranjo, Escuintla, *Heyde & Lux* 3275). *Limoncillo*; *Guacito*.

Dry or moist thickets or forest, 1,400 meters or less; Zacapa; Chiquimula; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Retalhuleu. British Honduras; Honduras; Salvador; Costa Rica.

A shrub or small tree 3-9 meters tall, the young branches densely velutinous-pilose with spreading hairs; leaves large, odd-pinnate, the petiole and rachis densely pilose; leaflets 5-9, obovate or obovate-oblong, membranaceous, short-petiolulate, mostly 6-15 cm. long and 3-6 cm. wide, opposite or alternate, obtusely short-acuminate, obtuse or acute at the base, hispidulous above on the costa and nerves or in age glabrate, densely velutinous-pilose beneath; panicles mostly axillary and 8-20 cm. long, densely hirtellous or pilose, the flowers short-pedicellate; calyx 5-lobate, 1.5-2 mm. long, the lobes lanceolate or lance-ovate, acute, hispidulous; petals whitish, hispidulous outside; filaments united below, hispidulous; ovary 3-celled, densely hispidulous; capsule broadly ovoid, 8 mm. long or larger, orange or dark red, densely tomentulose.

The Maya name of British Honduras is reported as "ixbahach"; in Salvador known as "cola de pavo," "canelillo," and "canjuro."

Trichilia erythrocarpa Lundell, Bull. Torrey Club 64: 551. 1937.

Moist or wet, mixed forest, 700 meters or less; Alta Verapaz. British Honduras, the type collected in advanced forest on limestone hillside near Cohune Ridge, El Cayo District, *Lundell* 6495; collected also about Valentín.

A tree as much as 25 meters high with a trunk 25 cm. in diameter, the branchlets densely short-pilose; leaves large, mostly even-pinnate, the leaflets

7-10, alternate, short-petiolulate, subcoriaceous, oblong or elliptic-oblong, 5-13 cm. long, 1.5-5 cm. wide, acuminate, acute or obtuse at the base, somewhat lustrous above, sparsely pilose at first but in age glabrate, paler beneath, rather densely pilose or finally glabrate; panicles axillary, 3-12 cm. long, branched from the base, hirtellous, the flowers pinkish white, sessile or short-pedicellate; calyx 5-dentate, hirtellous, the teeth subacute; petals oblong-ovate, 2 mm. long, minutely sericeous outside; stamen tube glabrous; ovary hirtellous; capsule 3-valvate, reddish, oblong, 1.5-2 cm. long, densely appressed-tomentulose, subterete; aril orange-red; seeds 11 mm. long.

Trichilia havanensis Jacq. Enum. Pl. Carib. 20. 1760. *T. havanensis* var. *lanceolata* C. DC. in DC. Monogr. Phan. 1: 677. 1878. *Limoncillo*; *Tiricia* (Petén); *Lagarto* (Quezaltenango); *Caimito de montaña* (Quezaltenango, probably an erroneous name); *Quina silvestre* (Huehuetenango).

Dry or moist thickets or mixed forest, often in second growth, 1,500 meters or less; Petén; Alta Verapaz; Izabal; El Progreso; Zacapa; Jutiapa; Escuintla; Guatemala; Sacatepéquez; Suchitepéquez; Huehuetenango; Quezaltenango; San Marcos. Mexico; British Honduras to Salvador and Panama; Cuba; Jamaica; northern South America.

A shrub or tree sometimes 12 meters high, the trunk seldom more than 20 cm. in diameter, the branchlets puberulent or glabrous; leaves large, odd-pinnate, the petiole and rachis puberulent or glabrous, the rachis sometimes narrowly winged; leaflets 3-9, broadly obovate to oblanceolate, or elliptic, rounded or obtuse at the apex, cuneate at the base, glabrous and very lustrous above, paler beneath and usually dull, glabrous, pellucid-punctate, the venation often prominent and reticulate; panicles axillary, sometimes crowded near the ends of the branches and forming a corymbiform inflorescence, the flowers long-pedicellate, the pedicels articulate at the base; calyx deeply 4-5-lobate, the lobes ovate or rounded, acute, hirtellous or glabrate; petals whitish or cream, ovate to oval, 3.5-5 mm. long, subacute or obtuse, glabrous or nearly so; stamen tube urceolate, sometimes lobate at the apex, pilose inside, glabrous outside or nearly so; anthers glabrous; ovary sessile on the disk, glabrous; capsule broadly ovoid or subglobose, about 1 cm. long; seeds 5-6.5 cm. long, the aril orange-red.

Called "bastard lime" in British Honduras, and the Maya name is recorded as "cot"; known in Salvador as "barrehorno," "barredero," and "ojo de muñeca." Brushes made from bunches of the leaves tied to the end of a pole are employed to brush coals and ashes from the large adobe ovens. The use of foliage of this species for this purpose seems to be common from Guatemala to Costa Rica. The leaves are rather stiff and probably hold up better under heat than those of other plants. In Huehuetenango the bark is one of the numerous "remedies" for malaria. The wood is used in Salvador and probably also in Guatemala for carving figures of dolls

called "chintas." It is yellowish, light, and soft, very easy to work, not durable; suitable for boxes and general carpentry when protected from the weather.

Trichilia hirta L. Syst. Nat. ed. 10. 1020. 1759. *T. spondioides* Jacq. Enum. Pl. Carib. 20. 1760. *T. spondioides* var. *gibbosifolia* C. DC. in Donn. Smith, Bot. Gaz. 20: 3. 1895 (type from Santa Rosa, Heyde & Lux 4453). *T. spondioides* var. *gibbosifoliola* C. DC. Ann. Cons. Jard. Bot. Genève 10: 153. 1907. *T. parvifoliola* C. DC. op. cit. 155 (type from El Cerrito, Lago de Amatitlán, Guatemala, H. Pittier 100). *Napahuite*; *Mapahuite*; *Mapaguite*; *Mapahuito*; *Trompillo* (Zacapa); *Cedrillo*, *Cedro colorado* (Petén).

Moist or dry thickets, sometimes in rather open, mixed forest, 1,800 meters or lower, most frequent in the lowlands, often in second growth; Petén; Zacapa; Chiquimula; El Progreso; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos; Quiché; Huehuetenango. Mexico; British Honduras to Salvador and Panama; West Indies; South America.

A shrub or small tree, seldom more than 6 meters high, the young branchlets hirsutulous or glabrous; leaves large, odd-pinnate, the petiole and rachis hirtellous or glabrous; leaflets petiolulate, membranaceous, usually 9-21, sometimes fewer, oblong-lanceolate to ovate-lanceolate, mostly 4-12 cm. long and 1.5-3.5 cm. wide, obtusely acute or acuminate, acute to rounded at the base and often very unequal, opposite or subopposite, more or less pilose beneath, especially along the costa, or often glabrous; panicles pedunculate, often large, hirtellous or glabrous, the flowers slender-pedicellate, the pedicels articulate below the middle; calyx glabrous or nearly so, the lobes deltoid or deltoid-ovate, acute; petals greenish white, oblong or elliptic, 5-6 mm. long, glabrous or nearly so; stamen tube lobate to below the middle, the lobes villous within, the anthers villous or glabrous; ovary hirtellous, sessile on the disk; capsule globose or subglobose, 1 cm. long or slightly larger, densely tomentulose; seeds 6-8 mm. long, the aril orange or red.

Called "red cedar" in British Honduras; "culimziz," "xculinsis," "pay-huy" (Yucatan, Maya); "cabo de hacha" (Yucatan); "cola de pavo," "jocotillo" (Salvador); "asa-pescado" (Campeche); "cedro espino" (Honduras). The name Mapahuite has been given to a *caserio* of Suchitepéquez. Under this name the shrub is well known in Guatemala and in some parts of Mexico. The seeds are reported to contain about 48 per cent of oil. They are sold in the markets of Guatemala, the expressed oil being a favorite cosmetic to give luster and smoothness to women's hair and perhaps also to destroy parasites. The name "asa-pescado," used in Campeche, is said to be applied because the wood is used for roasting fish.

Wilson in *North American Flora* recognized *T. parvifoliola* as a distinct species, but it appears to be only a form that is frequent on the Pacific slope, differing in no essential from *T. hirta*. The wood of *T. hirta* is reddish brown, hard, heavy, strong, durable, medium-textured, fairly straight-grained, somewhat splintery, takes a high polish, is suitable for furniture and implements.

Trichilia Matudai Lundell, *Lloydia* 2: 94. *pl.* 5. 1939.

Moist forest of the Pacific slope, 900–1,200 meters; Escuintla (below Las Lajas); Suchitepéquez (Finca Mocá); Sololá. Chiapas, the type from Mount Madre Vieja at 1,000 meters.

A tall tree sometimes 20 meters high with a trunk 30 cm. or less in diameter, the branchlets, petioles, and leaf rachis densely brownish-tomentulose with short appressed hairs; leaves large, mostly even-pinnate; leaflets mostly 5–8 pairs, on rather long petiolules, thick-membranaceous, alternate, oblong or lance-oblong, 5–18 cm. long, 3–5 cm. wide, acute or short-acuminate, acute or obtuse and usually very unequal at the base, sparsely strigillose or puberulent at first but in age almost completely glabrous; panicles pedunculate, mostly large and 12–30 cm. long, strigillose and puberulent, the pedicels 2–3 mm. long, articulate at or above the middle; calyx strigillose, shallowly 5-lobate, the lobes rounded; petals pale yellowish, 4 mm. long, strigillose outside, united below or to the middle; filaments united to the apex, the tube 2–2.6 mm. long, sparsely pilose outside, the anthers glabrous; ovary densely short-hirsute, 3-celled; fruit oval, about 1.5 cm. long, subterete, rounded at the apex and base, very densely velutinous-tomentose.

Trichilia minutiflora Standl. *Trop. Woods* 11: 20. 1927. *Chaltecoc* (Maya).

Common in climax forest, 400 meters or less; Petén. Campeche; British Honduras, the type from Orange Walk District, *Winzerling* VIII.1.

A tree of 6–20 meters, the trunk sometimes 25 cm. in diameter, the branchlets appressed-pilose with short hairs; leaves small, odd-pinnate, the rachis and petiole very slender, sparsely and minutely pilose; leaflets usually 7–11, short-petiolulate, mostly alternate, membranaceous, lance-oblong or elliptic-oblong, mostly 3–6.5 cm. long, 1–2.5 cm. wide, obtuse to obtusely long-acuminate, more or less oblique at the base and cuneate-acute to rounded, glabrous above except along the puberulent costa, copiously hirsute beneath along the costa, in age glabrate; panicles axillary, lax, branched from the base, mostly shorter than the leaves, the branches very slender, sparsely and minutely pilose; calyx 0.7 mm. long, minutely hirtellous, the 5 teeth short, usually obtuse; petals white, glabrous, 1.5 mm. long; stamen tube glabrous, minutely 5-dentate, bearing 5 anthers; ovary sericeous; fruit ovoid or oblong, 10–13 mm. long, very densely and minutely whitish-sericeous, obtuse and apiculate, the valves very thin; aril red.

Called “wild lime” in British Honduras, and the Maya name “xpucuskil” is reported. The wood is pale brown, hard, heavy, strong, fine-textured, not durable.

Trichilia montana HBK. Nov. Gen. & Sp. 7: 226. 1825. *T. yucatanensis* Lundell, Bull. Torrey Club 69: 392. 1942 (type from Campeche).

Moist or wet forest, 1,300 meters or less; Petén; Alta Verapaz; Izabal; San Marcos. Tabasco; British Honduras; Costa Rica; Panama; South America.

A shrub or tree, rarely more than 10 meters high with a trunk 20 cm. in diameter, often flowering when only a shrub, the branchlets, petioles, and rachis densely hirtellous or hirsute; leaves large, odd-pinnate; leaflets usually 5, petiolulate, opposite or subopposite, chartaceous, oblong-elliptic to elliptic-ovate, mostly 9–15 cm. long and 4–7 cm. wide, usually drying bright green, acuminate or abruptly acuminate, acute or obtuse at the base, almost glabrous above, beneath usually short-hirsute on the nerves, the venation prominent and reticulate; inflorescence axillary, small and congested, usually less than 5 cm. long, the branches hispidulous, the flowers short-pedicellate or sessile; calyx cupular, 4-dentate, hirtellous, the teeth acute; petals greenish white, densely sericeous or strigillose; stamen tube lobate, the lobes pilose above, the anthers pilose; ovary hirsute; capsule brownish or red, globose-ovoid, about 1 cm. long, often densely short-tuberculate, tomentulose and hirsute; seed usually 1, about 8 mm. long.

Called “carbón de río” in British Honduras.

Trichilia moschata Swartz, Prodr. Veg. Ind. Occ. 67. 1788. *Sibicté* (Alta Verapaz); *Copal colorado* (Petén); *Chacchaltecoc* (Petén, Maya).

Moist or wet forest, 1,600 meters or less; Petén; Alta Verapaz; Izabal. Tabasco; Campeche; British Honduras; Jamaica.

A tree, often 9–15 meters tall with a trunk as much as 30 cm. in diameter, the bark smooth, dark gray, the branchlets strigillose or glabrate; leaves rather large, odd-pinnate, the petiole and rachis strigillose or glabrous; leaflets mostly 5–9, alternate, long-petiolulate, subcoriaceous, oblong-elliptic or elliptic, mostly 6–15 cm. long and 2.5–7 cm. wide, abruptly short-acuminate, acute and often very unequal at the base, glabrous and somewhat lustrous above, glabrous beneath or hirtellous on the costa, usually darkening in drying; panicles mostly axillary, small, lax, and few-flowered, strigillose; calyx 4–5-lobate, strigillose, the lobes ovate, acute or subacute; corolla white, deeply 4–5-lobate, strigillose outside; stamen tube urceolate, glabrous; ovary densely hirsute; capsule ovoid or subglobose, 1.5–2 cm. long, densely velutinous-tomentose; seed usually 1 and 8–12 mm. long, surrounded by a red aril.

The dense red heartwood is said to be used in Guatemala for making marimba keys.

Trichilia Oerstediana C. DC. in DC. Monogr. Phan. 1: 677. 1878. *T. Donnell-Smithii* C. DC. in Donn. Smith, Bot. Gaz. 19: 2. 1894 (type from Lago de Amatitlán, Guatemala, *J. D. Smith* 1908).

T. Donnell-Smithii var. *uniomulata* C. DC. op. cit. 3 (type from Guarda Viejo, Guatemala, *J. D. Smith* 1909). *Limoncillo*; *Tiricio* (Petén).

Dry or moist forest or thickets, often in second growth, 200–1,800 meters, sometimes in oak forest; Petén; Alta Verapaz; Chiquimula; Jalapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Quiché; Huehuetenango. Honduras; Salvador; Nicaragua; Costa Rica.

A shrub or small tree, commonly 3–9 meters high, the branches densely pilose; leaves large, mostly odd-pinnate, the rachis and petiole densely pilose, the rachis often marginate; leaflets 5–11, oblanceolate-oblong to obovate-oblong, 1.5–3.5 cm. wide, rounded or obtuse at the apex, cuneate-attenuate to the base, subcoriaceous, glabrous above or nearly so and very lustrous, paler beneath and densely velutinous-pilose; panicles small and dense, axillary, mostly 2 cm. long or shorter, pilose, the flowers short-pedicellate; calyx 4–5-parted, hirtellous; petals 4–5, pale green or greenish yellow, puberulent or hirtellous outside or almost glabrous; stamen tube subcampanulate, pilose outside and within; ovary glabrous; capsule ovoid or subglobose, about 1 cm. long, the valves separating to the middle or almost to the base; seeds 1–3, surrounded by a red or orange aril.

Called “barredero” in Salvador. This species is probably used like *T. havanensis*, which it closely resembles except in pubescence. Both these species are distinguished from other local ones by the very lustrous upper surface of the leaflets, which are usually bright green when dried, rather than brownish or blackish.

Trichilia privigna Standl. & Steyer. Field Mus. Bot. 23: 167. 1944.

Known only from the type, Petén, steep shaly slopes along Río Santa Isabel, between mouth of Río Sebol and El Porvenir, 100 meters, *Steyermark* 45827.

A tree of 8 meters, the branchlets slender, brownish or fuscous, when young sparsely puberulent, soon glabrate, subterete; leaves small, pinnately 3-foliate, the slender petiole 12–15 mm. long, glabrate, the petiolules 3–5 mm. long, the rachis very short; leaflets elliptic to obovate-oblong or obovate-elliptic, 3–8.5 cm. long, 1.5–4 cm. wide, abruptly acuminate, with an acute or obtuse tip, acute or cuneate-acute at the base, firm-membranaceous, deep green above, puberulent along the costa, brownish beneath, glabrous or glabrate, the lateral leaflets commonly much smaller than the terminal one; panicles axillary, long-pedunculate, many-flowered, lax, the branches sparsely puberulent or almost glabrous, the flowers greenish, short-pedicellate; calyx glabrous or glabrate, 1 mm. broad, 0.8 mm. high, shallowly dentate, the teeth very broad, apiculate-subacute; corolla in bud minutely strigillose outside, 1.5 mm. long, probably slightly longer in anthesis.

In all characters except its 3-foliate rather than 1-foliate leaves this is almost exactly like *T. breviflora*. It may be only a form

or variety of that species, but until intermediate forms are discovered it may well stand as a distinct species.

***Trichilia trifolia* L. Syst. Nat. ed. 10. 1020. 1759.**

Said to be common in and around limestone sinkholes in Petén; on the Pacific coast growing in dry thickets on the plains, 400 meters or less; Petén; Retalhuleu. Western and southern Mexico; Salvador; Nicaragua; West Indies; Venezuela.

A shrub or a small gnarled tree, usually 6 meters high or less, the branchlets brownish, lenticellate, puberulent at first; petioles 1-3 cm. long; leaflets 3, or often only 1, petiolulate, thick-membranaceous, elliptic to obovate or oval, 2-6 cm. long, 1-3 cm. wide, rounded and often emarginate at the apex, cuneate-attenuate to obtuse at the base, glabrous or nearly so, domatiate beneath in the nerve axils; inflorescences axillary, very small, the flowers mostly fasciculate, subsessile or short-pedicellate; calyx cupular, 4-5-dentate, glabrous, the teeth triangular, acute or obtuse, ciliate; petals 3.5-5 mm. long, glabrous; stamen tube lobate to the middle or below, hirsute within, the anthers glabrous; capsule subglobose or globose-ovoid, 6-8 mm. long, hirtellous or glabrate; seeds 4.5-5 mm. long.

Sometimes called "pimientillo" in Salvador.

MALPIGHIACEAE

References: John Kunkel Small, *Malpighiaceae*, N. Amer. Fl. 25: 117-171. 1910. Franz Niedenzu, *Malpighiaceae*, *Pflanzenreich* IV. 141. 1928. C. V. Morton, *Enumeration of the Malpighiaceae of the Yucatan Peninsula*, Carnegie Inst. Wash. Publ. 461: 127-140. 1936.

Mostly shrubs or trees, often scandent, the pubescence most often of "malpighiaceous" hairs, i.e., stiff straight hairs attached by the middle, the pubescence thus strigose or sericeous, but sometimes also of spreading or laxly branched hairs; leaves generally opposite, broad or narrow, entire, dentate, or palmately-lobate, often with glands on the margins or on the lower surface; petiole often gland-bearing; stipules inserted upon the petiole or at its base; flowers mostly perfect, solitary, umbellate, racemose, or corymbose; cleistogamous flowers with more or less rudimentary organs present in some genera; sepals 5, some or all of them bearing sessile or stipitate glands, or the sepals sometimes all eglandular; corolla most often yellow but sometimes of other colors; petals 5, somewhat unequal, usually unguiculate, the blade often concave and undulate, dentate, fimbriate, or lobate; anther-bearing stamens 5 or 10, sometimes fewer, the filaments united at the base or higher, rarely distinct; anthers narrow or broad, the connective often large and conspicuous; carpels of the ovary usually 3, the ovary sessile, often lobate, sometimes appendaged, the styles distinct or united, slender throughout or enlarged or dilated at the apex; stigmas usually minute, entire or lobate; fruit drupaceous, nut-like, capsular, or of variously winged samaras.

Niedenzu recognizes 56 genera, widely distributed in the tropics of both hemispheres. The only other genus in Central America is

Spachea, with one species in Panama. As far as recent monographic work is concerned, this family has for the most part been treated in a most exasperating fashion. The only satisfactory treatment is that of Morton cited above, which unfortunately covers only a part of the Central American Malpighiaceae. The treatment in the *North American Flora* is badly done in several respects, especially as regards specific limits and the identification of types. The detailed work of Niedenzu is particularly annoying, because it seems so detailed and careful and was the result of many years of work upon the family. However, its author had little regard for the more usual rules of nomenclature. His work is cluttered with too often vaguely worded keys and an infinite number of minor varieties, subspecies, and forms, of which he himself apparently had no clear conception. Niedenzu's many minor forms serve only to cumber synonymy with useless and meaningless names and are a sad illustration of what sometimes happens when a herbarium botanist gives his imagination full sway in work upon a group of plants of which he has no field knowledge.

Torus flat or slightly concave; fruit drupaceous, fleshy, or densely setose, never winged; erect shrubs or trees.

Styles subulate at the apex; petals yellow *Byrsonima*.

Styles obtuse or thickened at the apex.

Styles distinct; petals pink, pale red, or lilac *Malpighia*.

Styles united; petals yellow *Bunchosia*.

Torus elevated, usually pyramidal and 3-sided; fruit usually of samaras, never drupaceous, dry, sometimes densely setose; plants usually scandent, rarely erect.

Fruit capsular, not at all winged, not setose; petals persistent in fruit; plants erect; flowers racemose *Galphimia*.

Fruit not capsular, usually of more or less winged samaras or nutlets, usually with large wings, sometimes densely setose; petals not persistent in fruit.

Fruit not winged, densely setose *Lasiocarpus*.

Fruit more or less winged, not densely setose.

Lateral wings of the samara obsolete or much reduced, the dorsal wing large and prominent.

Fertile stamens usually 4; leaves sometimes lobate; wing of the samara thickened along the inner edge *Stigmaphyllon*.

Fertile stamens 10; leaves never lobate.

Wing of the samara thickened along the outer edge, the wing much reduced, usually equaling or shorter than the body of the samara.
Brachypterys.

Wing of the samara thickened along the inner edge, usually longer than the body of the samara.

Stigma clavate or truncate *Banisteria*.

Stigma borne on the ventral edge of the dilated style tip . *Heteropteris*.

Lateral wings of the samaras well developed, the dorsal wing much smaller than the lateral ones.

Fertile stamens 3; staminodia 2. *Gaudichaudia*.

Fertile stamens 10; staminodia none.

Lateral wings of the samara deeply 2-lobate, the lobes narrow.

Tetrapteris.

Lateral wings of the samara not lobate.

Stipules borne on the stem; peduncle articulate and 2-bracteolate above the base. *Mascagnia*.

Stipules inserted on the petiole; peduncles not articulate, 2-bracteolate at the base. *Hiraea*.

BANISTERIA L.

Shrubs, usually scandent; leaves petiolate, entire, the stipules interpetiolar, inconspicuous; flowers terminal, mostly in leafy-bracteate panicles, the flowers often in 4-flowered umbels; calyx 8-10-glandular or rarely eglandular; petals pink, yellow, or white, long-unguiculate, the blade often fimbriate; stamens usually unequal; styles usually equal, the stigmas terminal, capitellate; fruit of samaras, the wing thickened above along the dorsal margin, the seed-bearing portion smooth, tuberculate, verruculose, or bearing 1 or more small wings; seed oblong, the embryo straight, curved, or inflexed.

Species about 75, in tropical America. Probably no other species is found in Central America.

Leaves sparsely or densely strigose beneath over the whole surface, often silvery or whitish. *B. argentea*.

Leaves not strigose beneath or very sparsely so, usually glabrous or with sparse pubescence of more or less spreading hairs.

Flowers large, 2 cm. broad or larger; pedicels glabrous or nearly so; glands much shorter than the sepals; seed-bearing portion of the samara smooth. *B. elegans*.

Flowers smaller, 1-1.5 cm. broad; pedicels usually densely strigose; glands usually almost as long as the sepals; seed-bearing portion of the samara usually bearing 1 or more tubercles or small wings. . . . *B. cornifolia*.

Banisteria argentea (HBK.) Spreng. Syst. 2: 388. 1825. *Heteropteris argentea* HBK. Nov. Gen. & Sp. 5: 164. *pl.* 450. 1822. *B. Schomburgkiana* Benth. Lond. Journ. Bot. 7: 129. 1848. *Banisteriopsis argentea* C. B. Robinson ex Small, N. Amer. Fl. 25: 133. 1910. *Banisteria argentea* var. *obtusiuscula* Niedenzu, Gen. Banist. 30. 1900. *Banisteria argentea* var. *acuminata* Niedenzu, loc. cit.

Dry or moist thickets, 250-1,300 meters, or rarely ascending to 2,400 meters(?); Zacapa; Chiquimula; Jalapa; Escuintla; Suchitepéquez; San Marcos; Huehuetenango. Southern Mexico; Honduras and Salvador to Panama; widely distributed in South America.

A large or small, woody vine, the branches densely whitish-strigose; leaves short-petiolate, lance-oblong to ovate or oval-elliptic, mostly 7–11 cm. long, obtuse-apiculate or long-acuminate, obtuse to subcordate at the base, bearing at the apex of the petiole or on the base of the blade beneath 2 small discoid short-stipitate glands, green and thinly strigose above, beneath usually densely whitish-strigose; inflorescences usually forming terminal, more or less leafy panicles, the flowers slender-pedicellate, the pedicels densely strigose; calyx usually bearing large glands but sometimes eglandular; petals bright yellow; samaras 3–4 cm. long, often pink or purple, the wing 1 1.5 cm. wide, densely strigose, the body irregularly tuberculate or bearing on each side a small hard abortive wing.

The two varieties recognized by Niedenzu differ only in leaf shape, which is highly variable in the family and of little or no systematic significance. Known in Salvador as “ala de zompopo” and “bejuco de casa,” the stems are often used there for tying the framework of lightly constructed dwellings.

Banisteria cornifolia (HBK.) Spreng. Syst. 2: 388. 1825. *Heteropteris cornifolia* HBK. Nov. Gen. & Sp. 5: 165. 1822. *H. acapulcensis* Rose, Contr. U. S. Nat. Herb. 5: 139. 1897. *Banisteriopsis cornifolia* C. B. Robinson ex Small, N. Amer. Fl. 25: 132. 1910. *Banisteria maracaybensis* var. *leiocarpa* Niedenzu, Gen. Banist. 6. 1900. *Banisteria guatemalensis* Niedenzu, Gen. Banist. 6. 1900 (type from Llano Grande, Baja Verapaz, Seler 2428). *Banisteriopsis guatemalensis* C. B. Robinson ex Small, N. Amer. Fl. 25: 132. 1910. *Pimienta* (Jalapa).

Mostly in dry rocky thickets, often in open oak forest, 1,400 meters or lower; Baja Verapaz; Izabal; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Retalhuleu. Southern Mexico; Costa Rica; Panama; South America.

A large or small, woody vine, the branches at first densely strigose, soon glabrate; leaves short-petiolate, often subcoriaceous, lance-oblong to elliptic or broadly ovate, mostly 7–12 cm. long, sometimes larger, acuminate or abruptly acute or short-acuminate, usually obtuse at the base, glabrous above and often lustrous, the nerves prominent or somewhat impressed, paler beneath, in age glabrous or nearly so but often with lax spreading hairs along the costa; flowers yellow, the inflorescences axillary and short, many-flowered, sometimes forming terminal leafy panicles, the branches and pedicels densely strigose, the pedicels 1 cm. long or shorter; sepals ovate, bearing large glands; samaras 2.5–3.5 cm. long, densely strigose, the wing 1 1.5 cm. wide, the basal portion usually with a short wing on each side.

In the typical form of the species (var. *typica* Niedenzu) the basal portion of the samara is appendaged; in var. *leiocarpa* Niedenzu it is smooth and without any appendages. Both varieties are represented in Guatemala. In the *Pflanzenreich* Niedenzu maintains *B.*

guatemalensis as a distinct species but remarks that it is very close to *B. argentea*, and perhaps a subspecies of it. There seems to be no good reason for attempting to distinguish it by name, for the supposed characters upon which it is based are evidently untenable.

Banisteria elegans Triana & Planch. Ann. Sci. Nat. IV. Bot. 18: 322. 1862. *Banisteriopsis speciosa* Small, N. Amer. Fl. 25: 133. 1910 (type from Cobán, Alta Verapaz, *Tuerckheim* II.1785). *B. elegans* var. *guatemalensis* Niedenzu, Malpigh. Amer. 2: 16. 1912 (based on the same collection as *B. speciosa*).

Wooded swamps or wet forest, 1,300–1,500 meters; Alta Verapaz (Cobán, *Tuerckheim* 1785). Venezuela and Colombia to Peru.

A woody vine, the branches glabrous or nearly so; leaves coriaceous, short-petiolate, oblong-ovate to broadly ovate, 10 cm. long and 6 cm. wide or smaller, rather long-acuminate, obtuse to subcordate at the base, glabrous or nearly so, lustrous above, drying brownish beneath, bearing 2 glands beneath at the base; inflorescences sometimes dense and many-flowered, glabrous or nearly so, the pedicels 1–1.5 cm. long; flowers large for the genus, 2 cm. broad or more, bright yellow; sepals ovate-rounded, the glands 1–2 mm. long; samaras sparsely strigose.

In the typical form of South America (var. *typica* Niedenzu) the glands of the sepals are 2 mm. long, in var. *guatemalensis* only 1 mm. The species is represented in North America only by the variety, which is known from a single collection. Further collections may show that it is a distinct species, being separated so widely geographically.

BRACHYPTERYS Jussieu

Woody vines; leaves opposite, entire; flowers yellow, solitary in the leaf axils or in large umbelliform corymbs; calyx with 8 glands, the 5 sepals broad, persistent; petals 5, the blades broad, unequal, crose-crenulate; stamens 10, all antheriferous, the filaments subulate or subulate-lanceolate, the anthers short; ovary 3-lobate; styles 3, distinct, slightly unequal; samaras 2–3, nut-like, the wing short, subapical, the body thick, ovoid, often tuberculate.

Two species, the other Brazilian. By Niedenzu the genus was united with *Stigmaphyllon*, but, as remarked by Morton, the 10 fertile stamens do not agree with his generic diagnosis of that group.

Brachypterys ovata (Cav.) Small, N. Amer. Fl. 25: 138. 1910. *Banisteria ovata* Cav. Diss. 429. 1790. *Stigmaphyllon ovatum* Niedenzu, Gen. Stigmat. pt. 2: 31. 1900.

Moist forest, or usually in mangrove swamps, at or little above sea level; Alta Verapaz (?; Chelac, at 1,500 meters, the specimens

sterile); Izabal. British Honduras; Panama; West Indies; South America.

A small or rather large vine, the stems glabrate; leaves rather thick, short-petiolate, ovate to narrowly oblong-lanceolate, 5-11 cm. long, attenuate to obtuse, rounded at the base, glabrous above or nearly so, paler beneath and strigose or in age glabrate; umbels mostly 3-4-flowered, subtended at the base by reduced leaves, the pedicels 1.5-3 cm. long; flowers bright yellow, 2.5-3 cm. wide; sepals ovate or oblong-ovate, 3.5-4 mm. long; petals glabrous; samaras 1.5 cm. long or smaller, hard and nut-like, the wing usually much shorter than the body.

The plant is common about mangrove swamps in the vicinity of Puerto Barrios.

BUNCHOSIA L. Richard

Shrubs or small trees, erect, the pubescence sericeous or strigose or of spreading, simple or branched hairs; leaves entire; stipules interpetiolar, mostly linear-lanceolate, distinct, acute, often very small; flowers yellow, in short or usually elongate, axillary racemes; calyx bearing 10 glands, these often confluent by pairs; petals and stamens glabrous, the filaments winged, connate below; styles free or connate, obliquely obtuse; fruit drupaceous, fleshy, containing 2-3 nutlets, 2-3-seeded; putamen of the nutlets smooth; embryo straight, the cotyledons plano-convex, the radicle short.

About 40 species, all in tropical America. A few additional ones are known from southern Central America. The generic name is said to be derived from an Arabic word, *bunchos*, signifying coffee.

Hairs of the leaves and stems not closely appressed, loose and spreading.

Leaves large, mostly 6-15 cm. wide or larger; petals glandular at the base.

B. pilosa.

Leaves small, mostly 3.5 cm. wide or narrower; petals eglandular.

Leaves glabrous above in age or nearly so. *B. lancifolia.*

Leaves densely pubescent on the upper surface in age. *B. montana.*

Hairs of the leaves and branches closely appressed.

Ovary, young fruit, and style glabrous; leaves glabrous. *B. Swartziana.*

Ovary, young fruit, and style sericeous or pubescent; leaves pubescent or glabrous.

Leaves with persistent pubescence of long appressed hairs beneath, even in age; petals glandular-dentate, at least near the base. *B. cornifolia.*

Leaves glabrous in age or essentially so; petals with or without gland-tipped teeth.

Leaf blades mostly 5-10 cm. wide, usually rounded or obtuse at the base; petals eglandular. *B. guatemalensis.*

Leaf blades mostly 2.5-4.5 cm. wide, acute or acuminate at the base; petals eglandular or glandular-dentate.

Petals unequal, the fifth one spatulate and entire, eglandular. . *B. gracilis.*

Petals subequal, all dentate and at least part of them glandular-dentate. *B. lanceolata.*

Bunchosia cornifolia HBK. Nov. Gen. & Sp. 5: 152. 1822. *B. Lanieri* Wats. Proc. Amer. Acad. 21: 461. 1886 (type collected near Izabal, Izabal, *S. Watson* 34). *Acerola*.

Moist, wet, or rather dry thickets, sometimes in rather open forest, 1,400 meters or less; Izabal; Zacapa; Jalapa; Jutiapa; Santa Rosa; Guatemala. Southern Mexico; Nicaragua; Costa Rica; Panama; Colombia and Ecuador.

A shrub or small tree, sometimes 10 meters high with a trunk 25 cm. in diameter, the branches ferruginous, at first densely strigose; leaves short-petiolate, membranaceous or rather thick, lance-oblong to elliptic or elliptic-ovate, mostly 5-15 cm. long and 2-6 cm. wide but sometimes as much as 35 cm. long and 14 cm. wide, acute or acuminate, usually abruptly so, acute to very obtuse at the base, green and almost glabrous above, beneath paler and covered with rather dense, laxly appressed, long, white hairs; racemes 3-12 cm. long, the flowers yellow, slender-pedicellate; sepals ovate, scarcely exceeding the glands, these 2-3 mm. long; ovary densely strigose; fruit orange or bright red, 2-3-seeded, about 1.5 cm. broad, sparsely strigose or almost glabrous.

It is rather probable that *B. Lanieri* is a distinct species, confined to the Atlantic lowlands of Guatemala, British Honduras, and Honduras. It has on the average much longer and wider leaves than the typical form, but otherwise it is hard to find any concomitant differences. None of the specimens presumably referable to *B. Lanieri* have good flowers, which might well supply additional specific characters.

Bunchosia gracilis Niedenzu, Gen. Bunchos. 5. 1898. *B. gracilis* f. *parvifolia* Niedenzu, Pflanzenreich IV. 141: 648. 1928 (based on *Tuerckheim* II.1812 from Cobán, Alta Verapaz). *Palo de chacha*.

Moist or wet, usually mixed forest, 900-2,400 meters; Alta Verapaz; El Progreso; Zacapa; Chiquimula; Guatemala; Chimaltenango; Quezaltenango; San Marcos. Southern Mexico; Nicaragua; Costa Rica; Panama.

A large shrub or small tree, sometimes 12 meters high, with slender branches, the young branchlets sparsely strigose; leaves small, short-petiolate, membranaceous, lance-oblong, mostly 6-12 cm. long and 2.5-3.5 cm. wide, or at times somewhat larger, long-acuminate, acute at the base, glabrous or nearly so except when very young, then strigose, often bearing 2 glands beneath at the base of the blade; stipules 1-2 mm. long; racemes much shorter than the leaves, with 20 or fewer flowers, the pedicels 4-5 mm. long; flowers bright yellow, 1.5 cm. broad; sepals ovate, ciliate, the glands obovate, 2.5-3.5 mm. long; petals glabrous, the blade lacerate-dentate, eglandular, the fifth petal spatulate; stamens glabrous; ovary and styles sericeous; fruit 2-3-seeded, glabrate, 8-12 mm. long, orange or red.

This species is particularly plentiful in the dense forest toward the summit of Volcán de Pacaya in the Department of Guatemala. It has been reported from Guatemala under the name *B. media* (Ait.) DC.

Bunchosia guatemalensis Niedenzu, Gen. Bunchos. 5. 1898 (type from Escuintla, *J. D. Smith* 1994).

Moist or dry thickets, 1,000 meters or less; Alta Verapaz; Izabal; Escuintla; Suchitepéquez; Retalhuleu; San Marcos; Huehuetenango. Chiapas.

A shrub or small tree 2-8 meters high, the branchlets thinly strigose or glabrate; leaves membranaceous, short-petiolate, bright green, elliptic-oval to lance-oblong, mostly 8-20 cm. long and 4-9 cm. wide, usually obtuse or rounded at the base, short-acuminate or long-acuminate, often abruptly so, glabrous or nearly so except when very young, then strigose; stipules 2-3 mm. long; racemes 12 cm. long or less, with 40 or fewer flowers, the pedicels 3-4 mm. long; sepals ovate-oblong, ciliate, the glands oval or obovate, 2-4 mm. long; ovary strigose; fruit orange-red, usually 2-seeded, glabrate, 1-1.5 cm. broad.

Guatemalan material has been reported as *B. nitida* (Jacq.) Rich.

Bunchosia lanceolata Turcz. Bull. Soc. Hist. Nat. Moscou 36, pt. 1: 582. 1863. *Limoncillo*; *Fruta de cabro*.

Moist or dry thickets or forest, 2,000 meters or less; Petén; Alta Verapaz; Chiquimula; Jalapa; Chimaltenango; Retalhuleu. Southern Mexico; British Honduras; Costa Rica; Colombia to Bolivia.

A shrub or small tree 8 meters high or less, the young branchlets strigose, soon glabrate; leaves short-petiolate, membranaceous or chartaceous, lance-oblong to elliptic-oblong, mostly 6-12 cm. long and 2-5 cm. wide, acuminate, acute or obtuse at the base, glabrous in age, often somewhat lustrous, bearing 2 small glands beneath near the base of the costa; racemes 6 cm. long or less, finally glabrate, 12-18-flowered, the pedicels 4-5 mm. long; flowers bright yellow, about 18 mm. broad; sepals ovate, ciliate, puberulent, the glands oblong, 3-3.5 mm. long; ovary sericeous; fruit orange-red, 1.5 cm. high, sometimes 2 cm. broad, usually 2-seeded, glabrate.

Called "cojón de fraile" in British Honduras. This species has been reported from Guatemala as *B. nitida* (Jacq.) Rich.

Bunchosia lancifolia Niedenzu, Gen. Bunchos. 6. 1898.

Known certainly only from the type, *Bernoulli & Cario* 3007, from San Lucas (Quezaltenango?); material from Dept. Guatemala probably is referable here.

Young branches densely stellate-tomentose; leaves short-petiolate, oblong, lanceolate, or linear-lanceolate, 7-11 cm. long, 2-3.5 cm. wide, acute at each end,

at first densely grayish-tomentose on both sides, glabrate above in age, chartaceous; racemes 8–20-flowered, 10 cm. long or less, axillary and in terminal panicles, the pedicels 5–8 mm. long; flowers 16–18 mm. broad; sepals oblong, ciliate, villous outside, the glands oval, 2–3 mm. long, half as long as the sepals; petals all lacerate-dentate, eglandular, the fifth spatulate; ovary tomentose.

***Bunchosia montana* Juss. Arch. Mus. Paris 3: 340. 1843.**

In forest or thickets, 1,350–1,800 meters or even higher; Chimaltenango; Quiché. Southern Mexico.

A shrub or small tree, the branchlets densely stellate-tomentose; leaves on short thick petioles, lanceolate or lance-oblong, sometimes oblong or lance-ovate, mostly 4–10 cm. long and 1–3 cm. wide, chartaceous, tomentose on both surfaces, more densely so beneath; stipules 1 mm. long; racemes usually 6–10-flowered, 3–4 cm. long, densely tomentose, the pedicels short or elongate; flowers yellow, 16–20 mm. broad; sepals ovate, villous outside, the glands 3 mm. long or less, almost equaling the sepals; ovary tomentose; drupes glabrate, orange, 1–2 cm. long.

This was once reported from Guatemala as *B. biocellata* Schlecht., a closely related Mexican species.

***Bunchosia pilosa* HBK. Nov. Gen. & Sp. 5: 156. 1822.**

Wet thickets or forest, 1,100 meters or less; Alta Verapaz; Suchitepéquez; Quiché. Honduras; Costa Rica; Panama; Colombia.

A shrub or small tree, in some parts of its range as much as 10 meters high but usually lower, the branches densely pilose or hirsute with long spreading hairs; leaves on short thick petioles, membranaceous or chartaceous, broadly oblong to obovate or rounded-elliptic, mostly 10–25 cm. long and 6–18 cm. wide, rounded or very obtuse at the base, abruptly acuminate, often almost rounded at the apex and abruptly contracted, abundantly and laxly pilose or hirsute on both surfaces with few-branched hairs, in age sometimes glabrate above; stipules 3–6 mm. long; racemes hispid, mostly 14–20-flowered and 4–8 cm. long, sometimes larger, the pedicels 6–9 mm. long; flowers yellow, 2–3 cm. broad; sepals 3.5–4.5 mm. long, little exceeding the glands, these oblong-oval; petals bright yellow, glandular on the margins; ovary pilose, 3-celled; fruit glabrate, 1–3-seeded, about 1 cm. long.

***Bunchosia Swartziana* Griseb. Fl. Brit. W. Ind. 115. 1859.**
B. Swartziana var. *yucatanensis* Niedenzu, Pflanzenreich IV. 141: 649. 1928. *Zipché* (Maya); *Genit*, *Hoja de viento* (Petén).

Moist thickets, 1,300 meters or lower; Petén; Jutiapa. Yucatan; Tabasco; British Honduras; West Indies.

A shrub or small tree 2–6 meters high, the young branches sparsely strigose, in age glabrous; leaves short-petiolate, elliptic or elliptic-lanceolate, mostly 4–9 cm. long and 2–4.5 cm. wide, acute or acuminate, with a usually obtuse tip, acute or acuminate at the base, glabrous, often lustrous above, 2-glandular beneath near the base; stipules 1 mm. long; racemes 6–10-flowered, the pedicels 5–6 mm. long, strigose; flowers yellow, 10–12 mm. broad; sepals oblong, ciliate, the glands obo-

vate, 1-2 mm. long; petals denticulate; ovary glabrous; drupe depressed-globose, 1-3-seeded, orange or yellow.

Maya names of Yucatan are recorded as "sipche" and "cibche." The wood is medium hard and creamy white. This species has been reported from the Yucatan region as *B. glandulosa* (Cav.) Rich. and *B. media* (Ait.) DC.

BYRSONIMA L. Richard

Shrubs or trees, rarely almost herbaceous, the young parts sericeous or tomentose; leaves entire, mostly short-petiolate; stipules intrapetiolar, commonly connate; flowers yellow, in mostly many-flowered, simple, terminal racemes; sepals 2-glandular, rarely eglandular; petals long-unguiculate, glabrous, the limb cordate or reniform, subentire; filaments scarcely connate, inserted on a hirsute torus; anthers about equaling the filaments, glabrous or pilose; ovary glabrous or sericeous, the styles subulate; fruit a drupe with scant or rather copious flesh, the stone 3-celled or by abortion 1-2-celled; embryo circinate.

Nieden zu recognizes 100 species, a number that probably should be greatly reduced. Only one Central American species besides the following is known, in Panama.

Leaves obovate, rounded at the apex, short-petiolate; hairs of the torus much intertangled.... *B. bucidæfolia*.

Leaves elliptic to lanceolate or rarely obovate, usually acute or acuminate, rather long-petiolate; hairs of the torus straight or almost so... *B. crassifolia*.

Byrsonima bucidæfolia Standl. Field Mus. Bot. 8: 16. 1930.

Northern British Honduras, and probably occurring in Petén; Yucatan.

A small tree, the branchlets densely sericeous at first, soon glabrate; petioles mostly 6 mm. long or less; leaf blades obovate or cuneate-obovate, 5-8 cm. long, 2.5-3.5 cm. wide, broadly rounded at the apex and often emarginate, cuneate or broadly cuneate at the base, thin, green above and glabrous or with a few lax deciduous hairs, paler beneath, laxly whitish-tomentose, the margins often revolute; racemes pedunculate, equaling the leaves, many-flowered, ferruginous-tomentose, the pedicels 4-8 mm. long; sepals 3-3.5 mm. long, ovate, obtuse, the glands half as long as the sepals; limb of the petals 5 mm. wide, coarsely dentate; fruit globose, yellow, 8-12 mm. in diameter, glabrous.

Called "craboo" in British Honduras; "nancén agria" (Yucatan); "zacpah" (Yucatan, Maya). The edible fruit is said to be sold in the markets of British Honduras.

Byrsonima coriacea (Swartz) HBK. is reported from Guatemala in the *Pflanzenreich* on the basis of a specimen attributed doubtfully to Cario and numbered 1147. Since the species has not been dis-

covered recently in Guatemala, it is suspected that the collection is referred erroneously to the country.

Byrsonima crassifolia (L.) HBK. Nov. Gen. & Sp. 5: 149. 1822. *Malpighia crassifolia* L. Sp. Pl. 126. 1753. *B. cotinifolia* HBK. Nov. Gen. & Sp. 5: 152. pl. 447. 1822. *B. pulchra* DC. Prodr. 1: 580. 1824. *B. rufescens* Bertol. Fl. Guat. 418. 1840 (type from Escuintla, Velásquez). *B. Karwinskiana* Juss. Ann. Sci. Nat. II. Bot. 13: 333. 1840. *B. laurifolia* HBK. var. *guatemalensis* Niedenzu, Pflanzenreich IV. 141: 724. 1928 (type from San Antonio de las Flores, Rojas 362). *Nance*; *Chi* (Quechí); *Tapal* (Cachiquel, Poconchí).

Moist or dry thickets or open forest, often abundant in pine forest, planted in many regions, mostly at 1,300 meters or less; Petén; Alta Verapaz; Baja Verapaz; El Progreso; Izabal; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Suchitepéquez; Retalhuleu; Quiché; Quezaltenango; San Marcos; Huehuetenango. Mexico; British Honduras to Salvador and Panama; West Indies; northern South America.

A shrub or tree, often fruiting when only 1-2 meters high but frequently a tree of 5-10 meters or even higher, the crown rounded or spreading, sometimes rather tall and narrow, the trunk straight or crooked, tall or short, the bark dark brown, rough, the inner bark pinkish; young branches covered with a dense or lax tomentum of rufous hairs; petioles mostly 8-15 mm. long; leaf blades ovate to elliptic or oblong-elliptic, mostly 8-15 cm. long and 4-7 cm. wide but variable in size, acute or acuminate, sometimes rounded and apiculate at the apex, acute or obtuse at the base, usually lustrous and glabrate above, beneath sparsely or densely tomentose with lax, rufous or grayish hairs, chartaceous; racemes equaling or longer than the leaves, many-flowered, sparsely or densely rufous-tomentose; petals yellow, turning dull red, the flower 1.5-2 cm. broad; ovary sparsely sericeous; drupes 8-12 mm. in diameter, dull yellow or tinged with orange, with abundant flesh.

Called "craboo," "crapoo," and "wild craboo" in British Honduras; "xacpah" (Yucatan, Maya); "nanchi" (Oaxaca, Veracruz); "crabo" (Honduras). The common name "nance" has been utilized in such Guatemalan place names as El Nanzal (a *nance* grove), El Nance, and Los Nances. It is of Nahuatl origin and is used throughout Central America.

Although this species is one of the common shrubs or trees of Guatemala that can be found almost anywhere below 1,500 meters, it is by no means generally distributed in a wild state. It is, however, characteristic of the open pine forests of Izabal and abundant at many places in the Oriente and in the dry areas of the Motagua Valley. Growing with *Curatella*, it often forms a distinctive chapar-

ral association that is well distributed along the drier portions of the Pacific slope of Central America, from Guatemala to Panama. The plants vary greatly in size. Those of dry thickets and forest are mostly shrubs or low trees of 5 meters or less, but in the Pacific lowlands, where most of the individuals seen are planted in *fincas*, they are large trees, so different in aspect that it is hard at first to believe that only a single species is represented. Niedenzu, indeed, excludes *B. crassifolia* from Central America and divides the material among three or four other species, but these are separated by him on characters that certainly are not dependable. The *nance* is planted chiefly for its edible fruit, which, however, is not very highly regarded. It has an agreeable, sweetish or slightly tart flavor that is rather insipid and reminds one of a poor apple. It is much eaten by children and by wild and domestic animals of all kinds. The fruit is sold in large quantities in the markets only because it is so cheap. *Dulces* or desserts sometimes are made from the fruit. The juice is used for flavoring *aguas gaseosas* and other beverages, and the rind gives a light-brown dye much used in Guatemala for cotton textiles. Ink is sometimes made from the bitter green fruit. The bark is a favorite material for tanning skins, and an infusion of the bark is a current domestic remedy for diarrhea. The fruit is utilized in Panama for preparing a fermented beverage called "chica" (probably a modification of *chicha*). The wood is dull reddish or pinkish brown, the sapwood lighter in color; rather hard and heavy, strong, brittle, with a more or less roey grain; texture rather coarse; fairly easy to cut, does not take a smooth natural finish; appears fairly durable. The wood is used in small quantities for construction and for fuel and charcoal.

GALPHIMIA Cavanilles

Erect shrubs, glabrous or pubescent; leaves slender-petiolate, thin, entire; flowers yellow, in simple or branched, terminal panicles, the bracts and bractlets minute, subulate or lanceolate; calyx usually without glands, the 5 sepals narrow, persistent; petals 5, entire or dentate, abruptly unguiculate at the base, persistent in fruit; stamens 10, all antheriferous, the filaments glabrous, united at the base, the anthers glabrous; ovary 3-lobate, the 3 styles slender, distinct, the stigmas minute; fruit a small 3-lobate capsule.

Species about 8, in tropical America, one in Brazil and Argentina, the others in Mexico. Only one extends to Central America.

Galphimia glauca Cav. Icon. 5: 61. 1799. *G. gracilis* Bartl. Linnaea 13: 552. 1839. *G. Humboldtiana* Bartl. op. cit. 555. *G.*

multicaulis A. Juss. Ann. Sci. Nat. II. Bot. 13: 327. 1840. *Thryallis glauca* Kuntze, Rev. Gen. 1: 89. 1891. *Chavelita; Lluvia de oro*.

Brushy slopes or dry rocky hillsides, often in pine-oak forest, 900–2,100 meters; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Sololá; Suchitepéquez; Quiché; Huehuetenango. Mexico; Honduras; Salvador; Nicaragua; naturalized in the West Indies and perhaps in other regions.

A shrub 1–3 meters high, densely branched, almost glabrous, the younger parts and the inflorescences with sparse subappressed rufous hairs; leaves membranaceous, slender-petiolate, ovate to oblong or oval, mostly 2–6 cm. long, obtuse, acute to rounded at the base, glabrous, green above, glaucous beneath, bearing small glands beneath at the base of the blade or on the upper part of the petiole; racemes dense and many-flowered, the flowers borne on long pedicels, the peduncles short, bracteolate; sepals oblong or lanceolate, 3–5 mm. long; petals bright yellow, the larger petals 7–12 mm. long, the blade ovate; capsule 3.5–4.5 mm. long, glabrous, almost smooth.

Called “botón de oro” in Salvador. This shrub is of rather limited distribution in Guatemala, but abundant locally. It is handsome because of the profuse flowers, which when cut last a very long time, ultimately turning brownish. The petals remain upon the living plants until the seeds are ripe. Large bunches of the flowers are offered for sale in the markets of Guatemala and other places. The plant has been introduced into cultivation for ornament in many parts of the tropics of America and the Old World. Niedenzu recognizes three species as occurring in Guatemala, *G. glauca*, *G. gracilis*, and *G. multicaulis*, but the characters by which he claims to separate them are not convincing.

GAUDICHAUDIA HBK.

Scandent shrubs, the pubescence strigose or sericeous, closely appressed; leaves membranaceous, usually rounded or subcordate at the base and entire, bearing 2 glands beneath above the base; stipules obsolete; flowers yellow, in small corymbs or umbels terminating the branchlets, part of the flowers normal and long-pedunculate, part of them abnormal or cleistogamous and on very short peduncles; sepals of the normal flowers ovate-oval, bearing 8–10 oval or oblong glands; petals spreading, unguiculate, the limb orbicular, fimbriate; stamens 5, the filaments dilated and connate at the base, the anthers subglobose; ovary 3-carpellate, the style usually 1; sepals of the abnormal flowers eglandular, the petals more or less abortive, with 1 stamen and an ovary of 2 carpels; fruit of samaras, the wing lateral, entire or 3-parted.

Ten species, ranging from Mexico to Venezuela. One or two other species are known from Central America.

Fertile stamens 3; inflorescence usually rather lax and open. *G. albida*.
Fertile stamens 5; inflorescence dense and congested. *G. hexandra*.

Gaudichaudia albida Cham. & Schlecht. *Linnaea* 5: 217. 1830. *G. Schiedeana* Juss. *Arch. Mus. Paris* 3: 591. 1843. *G. albida* var. *subtomentosa* Niedenzu, *Pflanzenreich* IV. 141: 243. 1928. *Chiltote*; *Bejuco de maripositas*; *Coco* (Cobán, Quecchi).

Moist or dry thickets or open forest, often in pine-oak forest, 500-2,500 meters; Alta Verapaz; El Progreso; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Sololá; Suchitepéquez; Quezaltenango; San Marcos; Huehuetenango. Mexico; Honduras; Salvador; Colombia and Venezuela.

A slender, small or large, woody vine, sometimes climbing over small trees, the branches densely whitish-strigose; leaves slender-petiolate, membranaceous, oval to oblong-oval or ovate, mostly 4-11 cm. long, obtuse and mucronate, rounded or obtuse at the base, green above and sparsely pilose, paler beneath and densely or sparsely sericeous; normal flowers yellow, 2.5 cm. broad or smaller, mostly sterile; sepals ovate-oval, incurved above, the glands 1.5-2 mm. long, half as long as the sepals; fertile stamens 3, one much smaller than the others; samaras often dark red or purple, about 1.5 cm. long, V-shaped, sparsely or densely appressed-hispid, the lateral wings thin, reticulate-veined, obtuse or rounded at the apex, the dorsal wings small, dentate or entire.

This has been reported from Guatemala as *G. filipendula* Juss., and from the Yucatan region as *G. mucronata* (Moc. & Sessé) Juss. Called "ala de zompopo" in Salvador and "chilillo-ac" in Yucatan (a combination of Spanish and Maya). The vine is a conspicuous one in either flower or fruit, often occurring in great abundance in dry thickets and hedges. It is most unpleasant to handle because the stiff hairs of the fruits are easily detached and penetrate the skin readily, causing great irritation.

Gaudichaudia hexandra (Niedenzu) Chodat, *Bull. Soc. Bot. Genève* II. 9: 100. 1917. *Tritomopterys hexandra* Niedenzu, *Malpigh. Amer.* 1: 30. 1912. *Aspicarpa hexandra* Hassler, *Ann. Conserv. Jard. Bot. Genève* 20: 210. 1918. *Bejuco llorón*.

Usually in dry rocky thickets, 600-1,500 meters; Chiquimula; Jalapa; Jutiapa; Guatemala (type from Río de las Vacas, between Chinantla and Chiquín, *Seler* 2406); as far as known, endemic.

A small or large vine, the young stems densely whitish-strigose; leaves slender-petiolate, mostly oval, 7 cm. long and 3.5 cm. wide or smaller, obtuse or broadly rounded at the apex and mucronate, rarely acute, obtuse at the base, membranaceous, green above, strigose or glabrate, paler beneath and usually densely strigose, eglandular; pedicels of the normal flowers 5-8 mm. long, the flowers bright yellow, 2 cm. broad; abnormal flowers densely crowded in the leaf axils and almost sessile; stamens 6 in the early flowers, 5 in most of the others, subequal; sepals of the

cleistogamous flowers lance-oblong, 4-5 mm. long; samaras usually unequal, V-shaped, the lateral wings about 12 mm. long, obtuse, usually dark red or purple, the dorsal wing much reduced and repand, the body of the samara densely hispid.

The species is closely related to *G. Karwinskiana* Juss., of Mexico and Costa Rica, and probably it will be reduced finally to synonymy under that.

HETEROPTERIS HBK.

Woody vines; leaves opposite, mostly petiolate, often gland-bearing beneath, the stipules inconspicuous; flowers yellow, blue, red, or white, in terminal racemes or corymbs, these often paniculate; pedicels equaling the peduncles or rarely exceeding them; sepals 2-glandular or eglandular; petals unguiculate, glabrous, the limb generally entire; stamens glabrous, usually subequal, the filaments united at the base, the anthers not appendaged; styles free, truncate at the apex and obtuse, acute, or uncinat; fruit of samaras, the wings thickened along the dorsal (outer) edge.

Species about 80, all in tropical America except one in Africa. A few additional ones occur in southern Central America. The generic nomenclature of *Heteropteris* and *Banisteria* is somewhat involved and causes great confusion in herbaria. Some recent American authors have used the name *Banisteria* for the group here treated as *Heteropteris*, using for the group here called *Banisteria* the generic name *Banisteriopsis* C. B. Robinson. Among the several species of *Banisteria* originally named by Linnaeus there is, unfortunately, none that is now placed in the genus so called. However, the generic names *Banisteria* and *Heteropteris* have always until recent times been applied in the sense in which they are used in the present paper, and it is preferable to use the names as adopted by Niedenzu in the only late monograph of the family. The nomenclature of the family already is sufficiently involved to make undesirable further name-tinkering in the group.

Sepals not recurved at the apex; petals pink; leaves persistently tomentose beneath. *H. Beecheyana*.

Sepals recurved at the apex; petals yellow; leaves glabrous beneath in age or nearly so.

Samaras 7-8 mm. long, the dorsal wing vestigial, not more than 5 mm. long. *H. Lindeniana*.

Samaras 2 cm. long or larger, the dorsal wing well developed.

Dorsal wing thick-coriaceous, 2.5-3 cm. wide, shorter than the seed-bearing portion of the samara or of about the same length; leaves mostly 7-10 cm. wide. *H. multiflora*.

Dorsal wing thin, much longer than the seed-bearing portion of the samara, about 1 cm. wide or somewhat wider; leaves mostly smaller. . *H. laurifolia*.

Heteropteris Beecheyana Juss. Ann. Sci. Nat. II. Bot. 13: 278. 1840. *H. Beecheyana* var. *guatemalensis* Niedenzu, Gen. Heteropl. 5. 1903 (type from Llano Grande, Baja Verapaz, *Seler* 2481). *Banisteria Beecheyana* C. B. Robinson ex Small, N. Amer. Fl. 25: 134. 1910. *H. retusa* Donn. Smith, Bot. Gaz. 16: 2. 1891 (type from Escuintla, *J. D. Smith* 2068). *B. retusa* C. B. Robinson ex Small, N. Amer. Fl. 25: 136. 1910. *Bejuco colorado*; *Ajitzché*; *Catarina fuego*; *Ajitzcam*.

Wet to dry thickets or open forest, sometimes in pine or oak forest, 1,800 meters or less; Petén; Izabal; Baja Verapaz; El Progreso; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Chimaltenango; Quiché; Suchitepéquez; San Marcos; Huehuetenango. Mexico; British Honduras to Salvador and Panama; Colombia and Venezuela to Bolivia.

A small or large vine, often climbing over trees, the branches brown, with numerous pale lenticels, when young densely appressed-pilose; leaves petiolate, mostly ovate or oval, usually 7 cm. long and 4 cm. wide or smaller, membranaceous, obtuse or retuse and mucronate at the apex, rounded or subcordate at the base, when young laxly tomentose on both surfaces, in age green and glabrate above, beneath persistently tomentose with long lax hairs, sometimes glabrate, the nerves often impressed above and the leaves thus rugose, the nerves very prominent beneath, the blade usually bearing 2-6 glands beneath near the base; flowers lilac-rose, 10-12 mm. broad, in 4-6-flowered umbels, these disposed in large panicles, the pedicels 2-4 mm. long; glands of the sepals oval, 1-1.5 mm. long; petals at least in part glandular-ciliate; samaras usually dark or purplish red in age, appressed-pilose, the body usually bearing on each side 1-3 small wings, the dorsal wing 2-2.5 cm. long and 10-13 mm. wide, very thin, rounded at the apex.

The Maya name "sobach" is reported from British Honduras and "chacanicab" from Yucatan. Niedenzu recognizes a number of varieties and forms, none of which have any practical interest.

Heteropteris laurifolia (L.) Juss. Ann. Sci. Nat. II. Bot. 13: 276. 1840. *Banisteria laurifolia* L. Sp. Pl. ed. 2. 611. 1762. *H. floribunda* HBK. Nov. Gen. & Sp. 5: 166. 1822. *H. floribunda* f. *eglandulosa* Donn. Smith, Enum. Pl. Guat. 2: 9. 1891, nomen. *Pomposa* (Petén); *Mariposa amarilla* (fide Aguilar).

Moist or dry thickets or open forest, 1,800 meters or less; Petén; Izabal; El Progreso; Zacapa; Chiquimula; Jutiapa; Escuintla; Retalhuleu; Quiché. Mexico; British Honduras to Salvador and Panama; West Indies; Colombia.

A small or large vine, or often an erect shrub or small tree, sometimes 6 meters high, the branches brown, conspicuously lenticellate, when young densely brown-sericeous; leaves short-petiolate, coriaceous, mostly oblong-lanceolate to oblong-

elliptic, 16 cm. long and 7 cm. wide or smaller, commonly acute or acuminate, sometimes obtuse, at the base obtuse or acute, in age glabrous or nearly so, often lustrous, usually eglandular but sometimes with a few small glands beneath near the base; flowers bright yellow, 1-1.5 cm. broad, racemose, the racemes paniculate, brown-tomentose, the pedicels 3-5 mm. long; sepals lanceolate, 3-3.5 mm. long, glandular or eglandular; petals crenulate; samaras brown-tomentulose, 2.5-4 cm. long, the body usually not cristate, the dorsal wing thin, rounded at the apex, 1-1.5 cm. wide.

Called "tietie" in British Honduras, the tough stems sometimes used as a substitute for cordage, especially in construction of huts; "escobillo" (Tabasco); "ala de zompopo" (Salvador); "mata-piojo" (Oaxaca).

Heteropteris Lindeniana Juss. Arch. Mus. Paris 3: 457. 1843.
Banisteria heterocarpa Standl. Trop. Woods 9: 11. 1927 (type from Orange Walk District, British Honduras, *H. W. Winzerling* V.15).
H. heterocarpa Standl. Field Mus. Bot. 12: 206. 1936.

In forest or thickets along streams, often on limestone, at or little above sea level; Petén. British Honduras; Campeche; type locality given as Yucatan, but perhaps really Tabasco.

A shrub or small tree sometimes 5 meters high, the branches grayish brown or fuscous, with numerous small lenticels, when young appressed-pilose, soon glabrate; leaves on short stout petioles, coriaceous, the petiole 2-glandular near the middle; leaf blades oblong-lanceolate or narrowly lanceolate, mostly 7-10 cm. long and 2-3 cm. wide, gradually narrowed to the obtuse apex, obtuse at the base, glabrous in age but when young brownish-sericeous, at least beneath, lustrous above, the venation not elevated, dull beneath; flowers yellow, in terminal panicles 8-11 cm. long, the branches densely appressed-pilose with brown hairs, the bracts rather conspicuous, 2-3 mm. long; sepals oblong, obtuse, 3-3.5 mm. long, eglandular or with large oblong glands, the tips recurved; samaras 2-3, about 1 cm. long and broad or smaller, densely appressed-pilose, the body irregularly transverse-cristate, the dorsal wing abortive, only 3-4 mm. wide.

Morton (Carnegie Inst. Wash. Publ. 461: 135. 1936) has suggested that *H. heterocarpa* be compared with *H. Lindeniana*, of which he had seen no material. A photograph of the type specimen in the Herbarium of Chicago Museum leaves no doubt that both names refer to the same species. The type is a specimen in flower, and Niedenzu treated *H. Lindeniana* as a variety of the Brazilian *H. acutifolia* Juss., which has altogether different fruit. *H. Lindeniana* is, as stated by Morton, closely related to another species of the Amazon Valley, *H. helicina* Griseb.

Heteropteris multiflora (DC.) Hochr. Bull. N. Y. Bot. Gard. 6: 277. 1910. *Malpighia reticulata* Poir. in Lam. Encycl. Suppl.

4: 8. 1816. *H. reticulata* Niedenzu, Gen. Heteropt. 54. 1903, not Griseb. 1858. *Banisteria multiflora* DC. Prodr. 1: 589. 1824. *B. reticulata* C. B. Robinson ex Small, N. Amer. Fl. 25: 138. 1910.

In *Manicaria* swamp, at sea level; Izabal (Puerto Barrios, Standley 73169). Honduras; Jamaica; northern South America.

A large vine, the young branches brown-tomentose; the older branches brown, with numerous large lenticels; leaves larger than in other species, on very short petioles, coriaceous, oblong or lance-oblong, mostly 15-26 cm. long, acuminate or obtuse, very obtuse or usually rounded at the base, in age glabrous or nearly so, lustrous above; flowers yellow, 12-18 mm. broad, racemose-paniculate, the inflorescence densely brown-tomentose, bearing numerous conspicuous foliaceous bracts and bractlets; sepals lanceolate, the glands oblong, 1.5-3 mm. long; blade of the fifth petal glandular-fimbriate at the base; samaras with a very thick, coriaceous or almost ligneous wing about 3.5 cm. long and 2.5 cm. wide, the body as much as 2 cm. long and 1 cm. broad.

HIRAEA Jacquin

Small trees or erect or scandent shrubs; leaves opposite, with slender stipules borne on the petioles, commonly coriaceous, entire, short-petiolate; calyx 8-glandular or eglandular; sepals 5, broad, persistent; corolla usually yellow, the blades of the petals oblong to reniform, undulate, denticulate, or fimbriate; stamens 10, all antheriferous; filaments subulate or almost filiform, the anthers subglobose to oblong or ovoid; ovary 3-lobate, the styles distinct, unequal or subequal; fruit of 3 samaras, these with distinct dorsal wings and small dorsal crests.

About 20 species, in tropical America. One or two additional species are found in southern Central America.

Umbels of flowers solitary, many-flowered; leaves rather thinly tomentose beneath. *H. Quapara.*

Umbels mostly clustered, 2-4-flowered; leaves glabrous beneath or variously pubescent.

Leaves densely tomentose or velutinous-pilose beneath, rounded or very obtuse at the apex *H. velutina.*

Leaves glabrate beneath or with pubescence of closely appressed hairs.

Anthers oblong; leaves acute or acuminate, acute or subobtuse at the base. *H. fagifolia.*

Anthers globose; leaves obtuse or rounded at the apex, narrowed to a subtruncate or shallowly cordate base *H. obovata.*

Hiraea fagifolia (DC.) Juss. Ann. Sci. Nat. II. Bot. 13: 258. 1840. *Banisteria fagifolia* DC. Prodr. 1: 590. 1824.

In thickets or forest, often along stream banks, 1,000 meters or less; Petén; Huehuetenango. British Honduras; Honduras; Costa Rica; Panama; South America.

Erect or scandent, sometimes a woody vine 10 meters long with a stem 2.5 cm. in diameter, the branchlets sericeous when young, soon glabrate; leaves short-

petiolate, coriaceous, elliptic-oblong or oblong, often broadest slightly above the middle, mostly 7–16 cm. long, acuminate, obtuse at the base, almost or quite glabrous in age, paler beneath; stipules borne on the petioles, subulate, conspicuous; flowers yellow, 1–1.5 cm. broad, in small panicles of 1–5 umbels, the pedicels slender, 12–15 mm. long; sepals suborbicular, short-acuminate, 2 mm. long, with or without glands; petals denticulate or fimbriate; body of the samara globose, the wings suborbicular or reniform, sinuate, 2–4 cm. long, 1.5–2.5 cm. wide, thin.

Niendenzu recognized several varieties and forms, of slight importance.

Hiraea obovata (HBK.) Niendenzu, Gen. *Hiraea* 7. 1906. *Malpighia obovata* HBK. Nov. Gen. & Sp. 5: 146. 1822. *H. borealis* Niendenzu, Gen. *Hiraea* 5. 1906. *Bejuco mariposa blanca*; *Utopchocac*, *Igchej* (Petén, Maya).

Moist or wet forest or thickets, often on limestone, 1,200 meters or less; Petén; Izabal; Alta Verapaz; Jutiapa; Santa Rosa; Escuintla; Retalhuleu. Southern Mexico; British Honduras; Honduras; Costa Rica; Panama; Colombia; Bolivia.

A small or large vine, sometimes 12 meters long, reported also as a small tree, the young branches sericeous, soon glabrate; leaves short-petiolate, chartaceous or membranaceous, obovate, oblong-obovate, or cuneate-obovate, mostly 9–14 cm. long, obtuse or rounded at the apex, narrowed to the base, the base itself narrow, usually truncate or subcordate, sericeous when young but in age glabrous or almost so, paler beneath; umbels almost sessile, mostly in clusters of 3, the pedicels 1.5–2 cm. long or longer, whitish-sericeous; flowers yellow, 1.5 cm. broad; sepals ovate, rounded at the apex, with or without glands; petals denticulate; samaras puberulent, the body small, subglobose, hard and nut-like, the wings thin, cuneate-obovate, 1.5–2 cm. long, 1–1.5 cm. wide, undulate-margined, conspicuously venose.

Hiraea Quapara (Aubl.) Morton, Carnegie Inst. Wash. Publ. 461: 131. 1936. *Banisteria Quapara* Aubl. Pl. Guian. 1: 464. 1775. *H. multiradiata* Juss. Ann. Sci. Nat. II. Bot. 13: 257. 1840. *H. smilacina* Standl. Contr. Arnold Arb. 5: 87. 1933 (type from Panama).

Moist or wet forest or thickets, at or little above sea level; Izabal (between Virginia and Lago de Izabal, *Steiermark* 38870). British Honduras; Costa Rica; Panama; Colombia and Guianas.

A small or large vine, sometimes 12 meters long, the young branchlets densely white-tomentose; leaves short-petiolate, membranaceous-chartaceous, oval to ovate or obovate, 17 cm. long and 9 cm. wide or smaller, abruptly acute or acuminate, obtuse or rounded at the base, green and glabrate above, beneath very densely tomentose at first, sometimes glabrate in age; petiole bearing 2 small glands at the

apex and 2 minute stipules at or near the base; umbels numerous, on short or elongate peduncles, the pedicels slender, tomentose, 1-2.5 cm. long; flowers yellow, 1.5 cm. broad; sepals broadly ovate, acute, the glands oblong-oval, 2-2.3 mm. long; fifth petal fimbriate, the others subentire; samaras pale green, densely velutinous-pilose, 2.5-3 cm. wide, about 2.5 cm. long, thin, venose, the dorsal crests small or often abortive, the margins of the wings undulate.

***Hiraea velutina* Niedenzu, Gen. *Hiraea* 6. 1906.**

Dry or moist thickets, 900 meters or less; Jutiapa; Retalhuleu. Southern Mexico; Salvador; Honduras; Colombia and Venezuela.

A shrub or a small tree, the young branches grayish-tomentose or velutinous-pilose; leaves short-petiolate, obovate or oval-obovate, mostly 5-16 cm. long, very obtuse or broadly rounded at the apex, narrowed to a truncate or subcordate base, subcoriaceous, green and glabrate above in age, pale beneath and densely soft-tomentose or velutinous-pilose; petioles stout, the stipules 4 mm. long, subulate, inserted above the base of the petiole; umbels short-pedunculate, fasciculate, the slender pedicels 12-15 mm. long, whitish-strigose; flowers about 17 mm. broad, bright yellow; sepals ovate, rounded at the apex, glandular or eglandular, 2.5 mm. long; petals denticulate.

The mature samaras were unknown to Niedenzu, and none are present on the specimens we have seen.

LASIOCARPUS Liebmann

Erect shrubs or small trees; leaves entire, the blades eglandular; flowers in axillary panicles or corymbs, the pedicels sessile; sepals incurved, eglandular; petals glabrous, white or yellow, short-unguiculate, strongly reclinate, subentire; stamens glabrous, the filaments slender, the anthers basifixed, oval or ovate; styles long-exserted, recurved, the stigmas 2-lobate; cocci of the fruit subglobose, the areole orbicular, concave, densely setose but otherwise glabrous.

Two other species are known, both in southern Mexico.

***Lasiocarpus multiflorus* Niedenzu, Arb. Bot. Inst. Braunschweig 8: 62. 1926. *Café de monte*.**

Dry slopes, 1,350-1,600 meters; Huehuetenango (between San Ildefonso Ixtahuacán and Cuilco, *Steyermark* 50696). Chiapas, the type from Hacienda Arenal, Tuxtla.

A shrub or a tree as much as 7 meters high, all the young parts and the inflorescence covered with a minute grayish pubescence; leaf blades oval or ovate, 12 cm. long and 6 cm. wide or usually smaller, subacute, rounded or obtuse at the base, chartaceous, glabrate but somewhat grayish; petiole bearing 2 inconspicuous glands on the upper surface near the apex; flowers paniculate, the panicles many-flowered, 12 cm. long or shorter, much branched, many-flowered, the pedicels slender, 6 mm. long or less; sepals ovate, incurved, 2.5 mm. long, eglandular; petals glabrous, yellow, the limb oval, subentire or minutely denticulate, 4 mm. long; ovary 3-lobed, globose, setose.

MALPIGHIA L.

Erect shrubs or trees; leaves entire in Central American species, coriaceous to membranaceous, mostly short-petiolate; stipules slender, small and inconspicuous; flowers in corymbs or umbels, sometimes solitary, the pedicels equaling or usually much longer than the peduncles; calyx 6-10-glandular; petals unequal, glabrous, more or less dentate or fimbriate, often ciliate, or some of them entire; stamens glabrous; ovary glabrous; styles free, obliquely obtuse; fruit drupaceous, normally of 3 nutlets and 3-seeded; putamen of the nutlets longitudinally 3-5-cristate and transverse-costate.

About 25 species, in tropical America. One other species, *M. mexicana* Juss., has been collected in Costa Rica and Mexico and may reach Guatemala.

Leaves acute or acuminate, glabrous; styles straight, equal *M. glabra*.

Leaves obtuse, rounded, or emarginate at the apex, glabrous or pubescent; styles curved, the 2 posterior ones longer and thicker than the anterior one.

Leaves densely sericeous beneath; inflorescences long-pedunculate *M. Lundellii*.

Leaves in age almost glabrous beneath; inflorescence sessile or nearly so.

M. puniceifolia.

***Malpighia glabra* L. Sp. Pl. 425. 1753.** *M. glabra* var. *guatemalensis* Niedenzu, Gen. Malpigh. 5. 1899 (type from Escuintla, J. D. Smith 2114). *M. glabra* var. *acuminata* Juss. Arch. Mus. Paris 3: 265. 1843. *Acerola*; *Nance*; *Panecito*; *Acerolata*; *Nance colorado*; *Sibche* (Petén, Maya).

Moist or dry forest or thickets, chiefly on the plains, often cultivated, ascending to 1,800 meters, at least in cultivation, but most common at 1,000 meters or lower; Petén; Alta Verapaz; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Retalhuleu; San Marcos; Huehuetenango. Western Texas; Mexico; British Honduras to Salvador and Panama; West Indies; northern South America.

Usually a shrub of 2-3 meters, sometimes a small tree of 5 meters, the young parts yellowish-sericeous but soon glabrate; leaves short-petiolate, chartaceous or subcoriaceous, ovate to ovate-lanceolate or oblong-lanceolate, mostly 8 cm. long and 3.5 cm. wide or smaller, acute or acuminate, acute or obtuse at the base, in age glabrous or essentially so and bright green; flowers pink or pale red, 12-16 mm. broad, in small corymbs, these 5-8-flowered, pedunculate, the pedicels 6-15 mm. long; sepals oblong or elliptic, the glands oblong, 3 mm. long or shorter; petals somewhat glandular on the margins; drupes cherry-red, trigonous-ovoid or subglobose, about 1 cm. in diameter.

Called "wild craboo" in British Honduras, and the Maya name "cipche" also reported; "chi," "canibinche," "box uayabte" (Yucatan, Maya); "camaroncito" (Salvador); "escobillo" (Tabasco).

The shrub is most common on the plains of the Pacific coast, where it often is abundant in the thickets and forest. In the same region it is also planted about houses, but in other parts of Guatemala it is uncommon in cultivation. The cherry-like fruit is juicy and acid, with but scant flesh, and it is of only minor importance. The fruit is sometimes used in preparation of *dulces* or alcoholic beverages. In Yucatan a decoction of the bark is a domestic remedy for diarrhea, and the bark, formerly at least, was employed there for tanning skins.

Malpighia Lundellii Morton, Carnegie Inst. Wash. Publ. 461: 138. 1936.

In thickets or forest on limestone, little above sea level; Petén. Type from Betsy Croft, Belize River, British Honduras, *Lundell* 4083; collected also in Tabasco.

A tree of 6-9 meters, the trunk 12-15 cm. in diameter, the young branchlets densely yellowish-sericeous; leaves almost sessile, oval or oblong, 9 cm. long and 3.5 cm. wide or smaller, very obtuse to rounded or retuse at the apex, obtuse at the base, chartaceous, in age glabrous above, densely silvery-sericeous beneath; flowers umbellate, reddish, the umbels on peduncles 2 cm. long or longer, the pedicels 9 mm. long or less; sepals ovate-lanceolate, 3.5 mm. long, the glands oblong, 2.5 mm. long; petals 10 mm. long, crose-lacerate.

Sometimes called "hicatee plum" in British Honduras.

Malpighia puniceifolia L. Sp. Pl. ed. 2. 609. 1762. *Pimientillo*; *Tocob* (Petén, Maya).

Dry or moist thickets, 600 meters or less; Petén (fide Lundell); Zacapa; Chiquimula; El Progreso. Southern Mexico; British Honduras; West Indies.

A shrub or small tree, the young branchlets densely whitish-sericeous; leaves on petioles 2-4 mm. long, membranaceous to subcoriaceous, elliptic-oblong or obovate-oblong, often obovate, 2-7 cm. long, 1-3 cm. wide, very obtuse or rounded at the apex, narrowed to the obtuse or subacute base, sericeous when young but in age glabrous or nearly so; umbels with 6 or fewer flowers, sessile or nearly so, the pedicels 6-15 mm. long; flowers pink or lilac, said to be sometimes white, 12 mm. broad; sepals ovate, the glands 2 mm. long; petals, at least in part, fimbriate; drupes red, broadly ovoid or subglobose, 1-1.5 cm. long, the nutlets 3-cristate.

Maya names of Yucatan are recorded as "uzte" and "xbec-che"; "manzanillo" (Campeche). The fruits are eaten, especially by children, wherever the shrub grows. The acicular hairs are stiff and penetrate the skin easily, causing intense and prolonged itching and irritation.

MASCAGNIA Bertero

Usually scandent shrubs; leaves short-petiolate, the stipules small, attached laterally to the base of the petiole; flowers axillary, in simple or paniculate racemes, sometimes umbellate; calyx with 6-10 glands, the sepals pubescent outside, glabrous within; petals mostly yellow but sometimes of other colors, unguiculate, glabrous or sometimes sericeous outside, usually undulate or crenate; stamens 10, all antheriferous, the filaments subulate to lanceolate, the anthers short or didymous; ovary 3-lobate, the styles distinct, unequal; samaras 3, with distinct or united lateral wings, the dorsal wing smaller than the lateral ones or obsolete.

Species about 40, in tropical America.

Leaves very obtuse, rounded, or emarginate at the apex; petals lilac, glabrous; ovary glabrous *M. vacciniifolia*.

Leaves acute or acuminate; petals yellow, glabrous or pubescent; ovary pubescent. Petals glabrous.

Leaves tomentose beneath, at least when young; samaras about as broad as high *M. sepium*.

Leaves glabrous; samaras much broader than high.

Glands at the apex of the petiole not elevated, inconspicuous *M. rivalaris*.

Glands at the apex of the petiole much elevated, conspicuous *M. excelsa*.

Petals sericeous outside.

Samaras 3.5 cm. broad or less; flowers small, about 1 cm. broad *M. polycarpa*.

Samaras 5-10 cm. broad; flowers large, about 2 cm. broad.

Samaras with numerous complicate irregular wings between the dorsal and lateral wings *M. nicaraguensis*.

Samaras without intermediate wings between the lateral and dorsal ones. *M. malpighioides*.

Mascagnia excelsa Standl. & Steyerl. Field Mus. Bot. 23: 168. 1944.

Moist or wet, mixed forest, at or near sea level; endemic; Izabal (type collected along Río Dulce, between Livingston and 6 miles up the river, on the north side, *Steyermark* 39456).

A tree, glabrous throughout or nearly so except in the inflorescence, the branches slender, sparsely lenticellate, subterete, ochraceous or greenish; leaves short-petiolate, thick-membranaceous, lustrous, the stout petioles 6-13 mm. long, bearing on the upper surface at or near the apex 2 large, much elevated, conspicuous glands; leaf blades oblong-lanceolate or ovate-lanceolate, 13-17 cm. long, 5-7.5 cm. wide, long-acuminate, obtuse or rounded at the base, bright green above, the nerves prominent, slightly paler beneath; inflorescences paniculate, axillary, sessile or short-pedunculate, several times branched, sometimes longer than the leaves, the branches rather stout, sparsely brown-puberulent or submentulose, the bracts and bractlets small, deltoid or subulate, scarcely 2 mm. long, the pedicels mostly 3-5 mm. long, much thickened toward the apex; sepals glabrate, 3 mm. long, the glands oval or suborbicular, half as long as the sepals; petals lemon-yellow, glabrous outside, long-unguiculate, 8 mm. long, the blade

suborbicular, sinuate-dentate; samaras glabrous, 2.5–3.5 cm. wide, 2–2.5 cm. high, the lateral wings very thin, irregularly undulate, the dorsal crest narrow, entire.

Mascagnia malpighioides (Turcz.) Morton, Carnegie Inst. Wash. Publ. 461: 130. 1936. *Stigmaphyllon malpighioides* Turcz. Bull. Soc. Nat. Moscou 36, pt. 1: 582. 1863. *M. nicaraguensis* var. *mexicana* Niedenzu, Pflanzenreich IV. 141: 122. 1928. *M. mexicana* Niedenzu, Gen. Mascag. 29. 1908.

Dry or wet thickets, 400 meters or less; Petén (Yaxha-Remate road, *Lundell* 2978). Veracruz and Chiapas; British Honduras.

A woody vine, the young branches thinly sericeous, soon glabrate; leaves short-petiolate, subcoriaceous, elliptic-oblong or oblong-ovate, mostly 8–15 cm. long, acute or acuminate, acute or obtuse at the base, at first sericeous beneath but in age glabrous or nearly so; sepals broadly ovate, little exceeding the glands; petals bright yellow, sericeous outside, the larger ones 10–12 mm. long, the blades suborbicular, lacerate-denticulate; samaras 6–10 cm. broad and as much as 6 cm. long, glabrate, the dorsal crest much smaller than the lateral wings, coarsely dentate or undulate.

Mascagnia nicaraguensis (Griseb.) Niedenzu, Pflanzenreich IV. 141: 121. 1928. *Jubelina nicaraguensis* Griseb. Vid. Medd. Kjoebenhavn 49. 1852.

Dry or moist thickets, 300–1,200 meters; Jalapa; Escuintla; Guatemala. Salvador; Nicaragua.

A large vine, the young branches whitish-sericeous; leaves petiolate, broadly ovate or elliptic, 13 cm. long and 8.5 cm. wide or smaller, acute or sometimes obtuse and apiculate, rounded or obtuse at the base, membranaceous-chartaceous, thinly whitish-sericeous at first but in age glabrate; stipules triangular, membranaceous; umbels about 4-flowered, solitary, clustered, or corymbose, terminal and axillary, sessile or nearly so, the pedicels 1 cm. long or more; flowers yellow, 2 cm. broad; sepals rounded, small, the 8 glands orbicular; blades of the petals lacerate-dentate; samaras about 5 cm. broad and almost as high, appressed-pilose at first, glabrate in age, the dorsal wing much smaller than the lateral ones, numerous complicate irregular wings present between the dorsal and lateral ones.

Mascagnia polycarpa Brandeg. Univ. Calif. Publ. Bot. 10: 409. 1924. *Hiraea polycarpa* Standl. Contr. U. S. Nat. Herb. 23: 1668. 1926.

Petén (El Paso, *Lundell* 1520); Santa Rosa(?). Veracruz and Oaxaca to Chiapas.

A vine, the young branches sparsely sericeous; leaves short-petiolate, oblong or ovate-oblong, 12 cm. long and 5 cm. wide or smaller, acute, rounded or obtuse at the base, chartaceous, glabrous, at least in age; inflorescences axillary or forming terminal panicles, the umbels few-flowered, pedunculate, the pedicels densely

whitish-sericeous; sepals 2 mm. long or slightly larger, little exceeding the glands; petals yellow, sericeous outside; samaras glabrate in age, about 3 cm. broad, the lateral wings 1-1.5 cm. high, the dorsal wings very small or abortive.

Here, it is suspected, is to be placed *Heyde & Lux* 4450 from Casillas, Santa Rosa, listed by Niedenzu in the *Pflanzenreich* as *M. volubilis* (Sims) Niedenzu, a species unknown otherwise on the North American continent.

Mascagnia rivularis Morton & Standl. Field Mus. Bot. 22: 148. 1940.

Wet forest, 500 meters or lower; Alta Verapaz (Cerro Chinajá); Izabal (type from Río Dulce, *C. L. Wilson* 375); endemic.

A large vine or a tree, said to be sometimes a tree 12 meters high, the young branches sericeous but soon glabrate; leaves on petioles 12 mm. long, subcoriaceous, narrowly oblong, 11-17 cm. long, 3-5 cm. wide, narrowly long-acuminate, cuneate at the base, glabrous, paler beneath; inflorescences axillary, paniculate, 6-10 cm. long, ferruginous-sericeous, the racemes very lax, the pedicels slender, 8-9 mm. long; calyx eglandular, the sepals oblong, scarcely 2 mm. long; petals yellow, equal, the blades oblong, 4 mm. long, 2 mm. wide, glabrous, entire; ovary densely pilose; samaras almost glabrous, 3-3.5 cm. broad, the very thin wings 1.5-2 cm. high, undulate, the dorsal wing small, slightly undulate.

Mascagnia sepium (Juss.) Griseb. in Mart. Fl. Bras. 12, pt. 1: 96. 1858. *Hiraea sepium* Juss. in St. Hil. Fl. Bras. Merid. 3: 19. 1832. *M. sepium* var. *velutina* Griseb. Vid. Medd. Kjoebenhavn 147. 1875.

Dry or moist thickets, 250 meters or lower; El Progreso; Retalhuleu; San Marcos. Honduras; South America.

A small or large vine, the stems slender, brown, with numerous conspicuous lenticels, densely pubescent or tomentose when young; leaves on short slender petioles, membranaceous, ovate or oblong-ovate, mostly 8 cm. long and 4 cm. wide or smaller, short-acuminate, rounded or cordate at the base, green and glabrate above in age, beneath paler, at first densely and laxly grayish-tomentose, in age sometimes glabrate; flowers yellow, corymbose, 10-13 mm. broad, the corymbs axillary, pedunculate, the pedicels slender, 5-10 mm. long; sepals ovate, obtuse, the glands 2-3 mm. long; samaras 2-3 cm. high and about as broad, suborbicular, glabrate in age, pale green, the lateral wings very thin, the dorsal wing very narrow and inconspicuous.

Mascagnia vacciniifolia Niedenzu, Gen. Mascag. 11. 1908.

Moist or wet forest, at sea level; Izabal (Río Dulce west of Livingston, *Steyermark* 39531). Southern Mexico; British Honduras; Costa Rica.

A woody vine, sometimes 15 meters long, the branches ferruginous, with exfoliating bark, when young rufous-sericeous; leaves coriaceous, on petioles 2-4 mm. long, obovate to oval, 3.5 cm. long and 2 cm. wide or smaller, rounded at the

apex, obtuse at the base, somewhat sericeous when very young but in age glabrous or nearly so, lustrous above; inflorescence rufous-tomentose, axillary, racemose or paniculate, with few or numerous flowers, the pedicels 10–13 mm. long; sepals lance-ovate, the glands oblong, 2 mm. long; petals lilac, 5–6 mm. long; samaras glabrous, about 2.3 cm. long and 1.5 cm. wide, green, rounded-ovate, emarginate at the apex, the body without a dorsal wing.

Schipp, who collected the plant in British Honduras, remarks that it is very handsome and “clings close like ivy,” presumably to tree trunks.

STIGMAPHYLLON Jussieu

Woody vines; leaves opposite, membranaceous or coriaceous, narrow or often very broad, entire, dentate, or lobate, often variable in shape on the same plant, on long or short petioles; flowers axillary, in pedunculate, often umbelliform corymbs; calyx with 8 glands, the 5 sepals usually broad, persistent; corolla yellow, the 5 petals unequal, erose, dentate, or fimbriate; stamens 10, usually only 4 of them fertile, the filaments unequal, united to the middle or only at the base, the anthers short and thick; ovary 3-lobate, the 3 styles distinct, unequal, hook-like or foliaceous at the apex; samaras 2–3, with a long broad wing, this thickened along the ventral (inner) edge, the body smooth or cristate.

About 55 species, in tropical America. One or two others occur in southern Central America. The generic name is variously written as *Stigmaphyllum*, *Stigmatophyllum*, and *Stigmatophyllum*, the last being the form adopted by Niedenzu on etymological grounds. In this he was technically correct, but the name was published originally as *Stigmaphyllon*, which is quite long enough for practical convenience.

Leaves glabrous beneath or nearly so except when very young.

Leaf blades oblong or elliptic, not cordate at the base, penninerved.

S. ellipticum.

Leaf blades ovate or rounded-ovate, cordate at the base, palmate-nerved at the base.

Leaves ciliate; umbels without leaf-like bracts at the base. *S. ciliatum*.

Leaves not ciliate; umbels with large leaf-like bracts at the base. *S. cordatum*.

Leaves sparsely or densely sericeous or tomentose beneath at maturity.

Leaves tomentose beneath, often lobate. *S. Humboldtianum*.

Leaves sericeous beneath with appressed hairs.

Wing of the samara somewhat constricted near the base, broadened upward; leaf blades often cordate at the base, frequently lobate, often somewhat palmate-nerved. *S. Lindenianum*.

Wing of the samara broad at the base and nowhere constricted; leaf blades obtuse or rounded at the base, never lobate, penninerved.

Sides of the body of the samara smooth, not cristate; leaves green beneath and only thinly sericeous. *S. puberum*.

Sides of the body of the samara somewhat cristate or rugose; leaves pale beneath and very densely covered with lustrous silky hairs.

S. pseudopuberum.

Stigmaphyllon ciliatum (Lam.) Juss. in St. Hil. Fl. Bras. Merid. 3: 49. 1832. *Banisteria ciliata* Lam. Encycl. 1: 369. 1783.

In mangrove swamps at sea level; Izabal. British Honduras; South America.

A small or large, slender vine, sometimes 5 meters long, the young branches sparsely sericeous; leaves on long slender petioles, ovate or rounded-ovate, 8 cm. long and 7 cm. wide or smaller, acute or obtuse and mucronate, deeply cordate at the base, sparsely long-ciliate, the basal lobes overlapping, glabrous, at least in age, pale beneath; petiole bearing 2 large discoid glands at the apex; umbels 4-7-flowered, terminating an axillary branch 5-10 cm. long, solitary, the pedicels 10-13 mm. long; flowers yellow, 4 cm. broad or larger; sepals ovate, the glands oval, 1.5-2.5 mm. long; petals fimbriate; samaras about 2 cm. long, the wing 1.5 cm. wide.

Although it has a very wide range in South America and in Trinidad, this species seems to be unknown in continental America between Brazil and Guatemala.

Stigmaphyllon cordatum Rose in Donn. Smith, Bot. Gaz. 18: 198. 1893.

Dry thickets, 1,500-1,700 meters; Guatemala (type from some unspecified locality in this department, *Heyde & Lux* 3267); Huehuetenango (Aguacatán); endemic.

A small vine, the branches sericeous at first; leaves long-petiolate, membranaceous, broadly ovate, 11 cm. long and 10 cm. wide or smaller, acute or abruptly short-acuminate, deeply cordate at the base, with an open sinus, glabrous, at least in age, paler beneath; petiole 4-8 cm. long, with 2 large glands at the apex; umbels often many-flowered, at the ends of long branchlets, leafy-bracteate at the base, the pedicels 1-1.5 cm. long, sericeous; flowers yellow, 2 cm. broad; sepals ovate or oblong-ovate, the glands 1-2 mm. long, much shorter than the sepal; samaras reddish, 2-3 cm. long, the wing 1 cm. wide.

Stigmaphyllon ellipticum (HBK.) Juss. Ann. Sci. Nat. II. Bot. 13: 290. 1840. *Banisteria elliptica* HBK. Nov. Gen. & Sp. 5: 161. 1822. *S. mucronatum* Juss. Arch. Mus. Paris 3: 377. 1843. *B. mucronata* DC. Prodr. 1: 589. 1824, in part. *Bejuco de ratón*.

Moist or dry forest and thickets, sometimes in pine forest, 1,400 meters or less; Petén; Alta Verapaz; Izabal; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Suchitepéquez. Southern Mexico; British Honduras to Salvador and Panama; north-western South America.

Usually a small slender vine, the branches sericeous at first, soon glabrate; leaves short-petiolate, chartaceous or membranaceous, oblong or elliptic, mostly 7-10 cm. long and 2-4 cm. wide, acute to rather long-acuminate, rounded or very

obtuse at the base, glabrous, bright green above, paler beneath; petiole bearing 2 sessile discoid glands at the apex; umbels 2-5-flowered, terminating elongate axillary branches, usually leafy-bracteate at the base, the pedicels 3-12 mm. long; flowers yellow, almost 3 cm. broad; sepals ovate, the glands 2 mm. long; petals suborbicular, more or less fimbriate; samaras 2.5 cm. long, the thin wing 7-8 mm. wide, obtuse, not constricted below, the body not cristate, smooth or nearly so.

Here presumably belongs a collection that we have not seen, reported from Alta Verapaz under the name *S. alternans* Triana & Planch., which pertains to a South American species of similar appearance. Known in Salvador by the names "tripa de gallina," "flor amarilla," "chinaca," and "flor de Jesús."

Stigmaphyllon Humboldtianum (DC.) Juss. Ann. Sci. Nat. II. Bot. 13: 288. 1840. *Banisteria tiliaefolia* HBK. Nov. Gen. & Sp. 5: 162. 1822, not Vent. 1803. *B. Humboldtiana* DC. Prodr. 1: 588. 1824. *S. Lupulus* Wats. Proc. Amer. Acad. 21: 461. 1886 (type from Río Chocón, *S. Watson* 35). *S. Lindenianum* subsp. *Lupulus* Niedenzu, Pflanzenreich IV. 141: 499. 1928. *S. Lindenianum* var. *Lupulus* Niedenzu, Gen. Stigmat. pt. 2: 19. 1900. *S. Lindenianum* var. *Watsonianum* Niedenzu, Pflanzenreich IV. 141: 499. 1928.

Wet to dry thickets or at the edge of forest, 900 meters or less; Alta Verapaz; Izabal; Chiquimula; Jutiapa; Santa Rosa; Retalhuleu. Southern Mexico; Nicaragua; Costa Rica; ranging far southward in South America.

A small or often a large vine, the young branches mostly brown-tomentose; leaves long-petiolate, membranaceous, usually blackening in drying, mostly rounded-ovate or broader, usually 9 cm. long or smaller, broadly rounded to deeply cordate at the base, almost rounded and apiculate to acuminate at the apex, often sparsely glandular on the margin, frequently deeply 3-lobate, more or less palmate-nerved at the base, green and glabrate above, usually densely tomentose beneath, even in age; petiole with 2 large sessile glands at the apex; inflorescences usually large and branched, the umbels many-flowered, leafy-bracteate at the base, the pedicels mostly 3-5 mm. long; flowers bright yellow, 16-18 mm. broad; sepals broadly ovate, the glands oblong, 2-3 mm. long; petals usually sparsely sericeous, the limb denticulate; samaras 3 cm. long, the wing thin, 12 mm. wide, obtuse or rounded at the apex, the body irregularly cristate or tuberculate.

This is a common and showy plant of the North Coast, often bearing large masses of brilliant flowers.

Stigmaphyllon Lindenianum Juss. Arch. Mus. Paris 3: 362. 1843. *S. tiliaefolium* var. *sericans* Niedenzu, Gen. Stigmat. pt. 2: 17. 1900. *S. sericans* Small, N. Amer. Fl. 25: 144. 1910. *S. Lindenianum* var. *yucatanum* Niedenzu, op. cit. 18. 1900.

Dry or wet thickets, 1,350 meters or less; Petén; Alta Verapaz; Izabal; Chiquimula; Retalhuleu. Southern Mexico; British Honduras to Panama.

A large or small vine, the branches sericeous at first, soon glabrate; leaves long-petiolate, very irregular in shape, entire or deeply 3-lobate, usually blackening when dried, sometimes remotely glandular-ciliate or sinuate-dentate, cordate or truncate at the base or often rounded, acute to rounded and apiculate at the apex, green and glabrous above or nearly so, sparsely or densely sericeous beneath with closely appressed hairs; petiole bearing 2 large glands at the apex; umbels borne on axillary, often greatly elongate, simple or branched peduncles, usually many-flowered, often with large leaf-like bracts at the base, the pedicels 4–8 mm. long; flowers bright yellow, 15–18 mm. broad; sepals broadly ovate, the glands 1.5 mm. long, oval; limb of the petals crenulate, orbicular; samaras about 2.5 cm. long, the body costate laterally, the wing rounded or obtuse at the apex, thin, not narrowed at the base.

This species and *S. Humboldtianum* were much confused by Niedenzu, but a lucid account of them is given by Morton; see Carnegie Inst. Wash. Publ. 461: 136. 1936.

Stigmaphyllon pseudopuberum Niedenzu, Malpigh. Amer. 2: 28. 1912.

Moist or dry forest, 800–1,400 meters; Alta Verapaz (type from Cobán, *Tuerckheim* 8385); Suchitepéquez; Quezaltenango; Huehuetenango. Chiapas; British Honduras.

A small or large vine, the young branches densely sericeous; leaves on long or short petioles, chartaceous or membranaceous, ovate, 15 cm. long and 8 cm. wide or smaller, acuminate or long-acuminate, rounded or obtuse at the base, entire, green and glabrate above in age, beneath very densely covered with closely appressed, lustrous, silvery or yellowish hairs even in age; inflorescences corymbose or umbelliform, simple or branched and sometimes forming large panicles, the pedicels 8 mm. long or less, densely sericeous; flowers yellow, 12 mm. broad; sepals broadly ovate, the glands oval, 1.5–2 mm. long; samaras sericeous, 4.5 cm. long or shorter, the body cristate, the wing oblong-obovate, sometimes 2 cm. wide.

Stigmaphyllon puberum (L. Rich.) Juss. Ann. Sci. Nat. II. Bot. 13: 289. 1840. *Banisteria pubera* L. Rich. Act. Soc. Hist. Nat. Paris 1: 109. 1792.

British Honduras, and to be expected in northern Guatemala; Honduras; Costa Rica; Panama; West Indies; South America.

A large vine, sometimes 10 meters long, the branchlets sericeous at first; leaves on rather long petioles, chartaceous, rounded-ovate to lance-ovate, 17 cm. long and 12 cm. wide or smaller, short-acuminate or long-acuminate, often abruptly so, obtuse or rounded at the base, green and glabrate above, beneath usually sparsely sericeous or at first densely so; peduncles axillary, elongate, bearing 1 or several umbels, these 5–10-flowered, the pedicels 3–6 mm. long, densely sericeous;

sepals ovate, the glands oval or obovate, 1-1.3 mm. long; petals bright yellow, the blades fimbriate, 5-8 mm. wide; samaras sometimes 3 cm. long but often shorter, broad at the base and narrowed upward to an obtuse apex, thinly sericeous.

TETRAPTERIS Cavanilles

Woody vines; leaves petiolate, membranaceous to coriaceous, entire, opposite; stipules inconspicuous, deciduous; flowers yellow; calyx usually bearing 8 glands; petals 5, the blades oblong to orbicular, usually undulate or dentate; stamens 10, all antheriferous, the filaments triangular to subulate, the anthers broad; ovary 3-lobate, the styles 3, distinct, equal or nearly so; fruit of 3 samaras, each bearing 4 wings, the 2 upper wings usually larger than the 2 lower ones.

About 70 species, in tropical America. One or two additional ones are known from southern Central America. The generic name is written *Tetapterys* by Niedenzu on etymological grounds.

Stipules of the opposing leaves connate in pairs, leaving a circular scar around the stem; lower lateral wings of the samaras much smaller than the upper ones; flowers umbellate.

Samaras with irregular intermediate wings and crests between the dorsal and lateral wings; upper lateral wings 2.5 cm. long or shorter, glabrate.

T. discolor.

Samaras without intermediate wings between the dorsal and lateral ones; upper lateral wings 3-4.5 cm. long, persistently sericeous. *T. acapulcensis.*

Stipules all free, small, soon deciduous; lower lateral wings almost as large as the upper ones.

Inflorescence racemose, not at all umbellate, the bractlets conspicuous, green, 2-7 mm. long, narrowed at the base.

Pubescence of the leaves closely appressed. *T. Seleriana.*

Pubescence of the leaves lax and somewhat spreading. *T. arcana.*

Inflorescence umbellate-paniculate, at least the terminal flowers arranged in 2-4-flowered umbels, the bractlets minute, 1.5 mm. long or less, broad at the base.

Branches of the inflorescence glabrous; wings of the fruit glabrous or nearly so; leaves of the inflorescence mostly rounded or reniform and rounded or retuse at the apex, glabrous or nearly so. *T. Nelsoni.*

Branches of the inflorescence densely pubescent; wings of the fruit persistently sericeous; leaves all or mostly acute or acuminate, not rounded or reniform, pubescent, at least beneath along the costa, and often over the whole surface. *T. Schiedeana.*

Tetrapteris acapulcensis HBK. Nov. Gen. & Sp. 5: 168. 1822.
T. crispa Juss. Ann. Sci. Nat. II. Bot. 13: 265. 1840.

Moist or wet thickets, 250 meters or less; Alta Verapaz (between Limón and Chisec, *Steyermark* 45122). British Honduras (Missouri, Río Grande, 75 meters, *Schipp* 1147, growing in forest); Mexico (Acapulco, Guerrero); Panama; South America.

A large vine as much as 15 meters long with a stem 5 cm. in diameter, the young branches densely whitish-sericeous; leaves short-petiolate, chartaceous, ovate or elliptic, 15 cm. long and 10 cm. wide or smaller, acute or acuminate, rounded or subcordate at the base, sericeous when young but in age almost glabrous; flowers bright yellow, 13–17 mm. broad, umbellate; sepals ovate, the glands unequal, 2–3.5 mm. long; samaras green, persistently sericeous, the upper wings obovate-oblong, in the typical form about 3 cm. long, obtuse or rounded at the apex, thick and firm, the lower lateral wings much shorter than the upper ones.

The single British Honduras collection is referable to var. *macrocarpa* (Niedenzu) Morton, Carnegie Inst. Wash. Publ. 461: 132. 1936 (*T. crispa* subsp. *typica* Niedenzu, var. *subcordata* Niedenzu, f. *macrocarpa* Niedenzu, Pflanzenreich IV. 141: 214. 1928), in which the upper lateral wings are 4–4.5 cm. long.

Tetrapteris arcana Morton, Carnegie Inst. Wash. Publ. 461: 132. 1936.

Wet forest or thickets, sometimes in pine forest, 600 meters or less; Petén; Alta Verapaz; Izabal. British Honduras (type from Río Privación, Mountain Pine Ridge, El Cayo District, *H. H. Bartlett* 11796); Salvador.

A small or large vine, sometimes 10 meters long, the stems densely sericeous; stipules minute, subulate; leaves short-petiolate, subcoriaceous, elliptic or oval, 7.5 cm. long and 3.5 cm. wide or smaller, short-acuminate, rounded at the base, more or less brownish when dried, green and almost glabrous above, laxly pilose beneath, the pubescence persistent; flowers yellow, 12 mm. broad, racemose, the pedicels pilose, 8 mm. long or less; sepals 3.5 mm. long, sericeous, the glands linear-oblong, 2 mm. long; blades of the petals inconspicuously denticulate; anthers pilosulous; samaras sericeous, the lateral wings linear-oblong or oblanceolate, subequal, 9–11 mm. long, the dorsal wing deltoid, 2.5 mm. long.

Tetrapteris discolor (G. F. W. Meyer) DC. Prodr. 1: 587. 1824. *Triopteris discolor* G. F. W. Meyer, Prim. Fl. Esseq. 182. 1818. *T. discolor* var. *lanuginosa* Niedenzu, Gen. Tetrap. 42. 1909 (type said to have been collected in Guatemala by Warszewicz; probably from some other country).

Moist or dry thickets or forest, 1,400 meters or less; Santa Rosa; Escuintla; Guatemala; Retalhuleu. Chiapas; British Honduras; Costa Rica; Panama; South America.

Usually a large vine, the young branches whitish-sericeous; leaves short-petiolate, chartaceous, oblong to oval-oblong or obovate-oblong, 15 cm. long and 8 cm. wide or smaller, short-acuminate, usually abruptly so, obtuse at the base, glabrous or nearly so, at least in age; flowers yellow, umbellate, about 12 mm. broad, the umbels about 4-flowered, solitary in the leaf axils or in small panicles, the pedicels 3–4 mm. long; sepals ovate or lanceolate, the glands oval, 2.5–3 mm.

long; blade of the petals subentire or denticulate; samaras glabrate except on the body, the lateral wings obovate, obtuse or rounded at the apex, the upper ones almost 2 cm. long, the lower ones half as long, 6–8 mm. wide; dorsal wing small, semiorbicular.

Tetrapteris Nelsoni Rose, Contr. U. S. Nat. Herb. 5: 143. 1897. *T. nummularia* Niedenzu, Gen. Tetrapt. 38. 1909. *T. emarginata* H. H. Bartlett, Proc. Amer. Acad. 43: 53. 1907 (type from Gualán, Zacapa, 125 meters, C. C. Deam 150).

Known in Guatemala only from Gualán. Oaxaca.

A slender vine, the branchlets glabrous from the first or nearly so; leaves small, almost sessile, stiff-membranaceous, bright green, ovate or oblong-elliptic to suborbicular or subreniform, less than 4 cm. long, usually broadly rounded to deeply emarginate at the apex, obtuse to cordate and amplexicaul at the base, glabrous; umbels 4-flowered, terminating short leafy branches, the glabrous pedicels 2–5 mm. long; flowers 1.5 cm. broad; glands of the sepals 1.3–2 mm. long; lateral wings of the samaras subequal, about 12 mm. long, 4–6 mm. wide, glabrous.

Tetrapteris Schiedeana Cham. & Schlecht. Linnaea 5: 218. 1830. *Malpighia dasycarpa* Donn. Smith, Bot. Gaz. 24: 390, at least in part. 1897. *Heteropteris yucatanensis* Millsp. Field Mus. Bot. 1: 369. 1898. *T. eriocarpa* Bertol. Fl. Guat. 419. 1840 (type from Guatemala, Velásquez). (?) *T. argentea* Bertol. loc. cit. (type from Antigua, Sacatepéquez, Velásquez). *Bejuco treach* (Petén, fide Lundell); *Palo de estrellitas* (fide Aguilar).

Moist or dry thickets or forest, 1,500 meters or less; Petén; Alta Verapaz; Jalapa; Santa Rosa; Escuintla; Guatemala; Retalhuleu; Quezaltenango. Southern Mexico; British Honduras to Costa Rica.

A small or large vine, sometimes 15 meters long, the young branches sericeous, soon glabrate; leaves short-petiolate, membranaceous, oblong-ovate to oblong-lanceolate, 10 cm. long and 3.5 cm. wide or smaller, acute or acuminate, obtuse or rounded at the base, green above and glabrous, at least in age, appressed-pilose beneath, at least on the costa; flowers yellow, 10–12 mm. broad, umbellate, the umbels with 7 or fewer flowers, the pedicels 2–5 mm. long; sepals ovate, the glands oval, 2–3 mm. long; petals entire; samaras sericeous, the lateral wings oblong or obovate, subequal, 15 mm. long or shorter, 5–8 mm. wide, obtuse; dorsal wing 5 mm. wide or narrower, crenulate.

Tetrapteris Seleriana Niedenzu, Bot. Jahrb. 36, Beibl. 80: 18. 1905 (type from Yucatan).

Moist or rather dry thickets or forest, sometimes on limestone, 700 meters or less; Petén; Alta Verapaz. Tabasco; Yucatan; British Honduras.

A woody vine, the branchlets glabrous or nearly so; leaves short-petiolate, membranaceous-chartaceous, oblong or lance-oblong, 9 cm. long and 3 cm. wide or smaller, acute or acuminate, mostly obtuse at the base, usually brownish when dried, glabrous above, at least in age, beneath sparsely sericeous with closely appressed hairs; flowers yellow, 1 cm. broad, racemose, the pedicels sericeous, 3 mm. long; sepals ovate, the glands oblong, 2-2.5 mm. long; wings of the samaras glabrate, subequal, oblong or oblanceolate-oblong, 5-8 mm. long, obtuse or rounded at the apex.

INDEX

- Abrus, 156
 Acacia, 3
 Aeschynomene, 157
 Albizzia, 15
 Alvaradoa, 426
 Amyris, 399
 Andira, 163
 Apoplanesia, 165
 Arachis, 165
 Astragalus, 167
 Ateleia, 168
 Averrhoa, 374

 Banisteria, 470
 Barbieria, 168
 Bauhinia, 89
 Biophytum, 375
 Brachypterys, 472
 Bunchosia, 473
 Bursera, 435
 Burseraceae, 434
 Byrsonima, 477

 Cabralea, 445
 Caesalpinia, 96
 Caesalpinieae, 88
 Cajanus, 169
 Calliandra, 18
 Calopogonium, 170
 Canavalia, 173
 Carapa, 445
 Casimiroa, 401
 Cassia, 105
 Cedrela, 446
 Centrosema, 178
 Ceratonia, 133
 Cercis, 133
 Chaetocalyx, 181
 Cicer, 182
 Citrus, 404
 Climacorachis, 183
 Clitoria, 184
 Cologania, 186
 Coursetia, 188
 Cracca, 189
 Crotalaria, 193
 Crudia, 133
 Cynometra, 134

 Dalbergia, 201
 Dalea, 208
 Decatropis, 410

 Decazyx, 411
 Delonix, 135
 Derris, 217
 Desmanthus, 28
 Desmodium, 217
 Dialium, 136
 Dioclea, 242
 Diphyssa, 244
 Dolichos, 247
 Dussia, 248

 Entada, 29
 Enterolobium, 31
 Eriosema, 249
 Erodium, 368
 Erythrina, 252
 Erythroxylaceae, 390
 Erythroxylon, 390
 Esenbeckia, 411
 Eysenhardtia, 259

 Galactia, 260
 Galipea, 413
 Galphimia, 479
 Gaudichaudia, 480
 Geraniaceae, 368
 Geranium, 370
 Gliricidia, 264
 Glycine, 266
 Guaiacum, 394
 Guarea, 451

 Haematoxylon, 137
 Harpalyce, 267
 Heteropteris, 482
 Hiraea, 485
 Hymenaea, 141

 Indigofera, 267
 Inga, 34

 Kallstroemia, 396

 Lasiocarpus, 487
 Lathyrus, 272
 Leguminosae, 1
 Lennea, 274
 Lens, 275
 Leucaena, 46
 Linaceae, 387
 Linum, 387
 Lonchocarpus, 276

Lotus, 286
Lupinus, 287
Lysiloma, 48

Machaerium, 290
Malpighia, 488
Malpighiaceae, 468
Mascagnia, 490
Medicago, 297
Megastigma, 414
Melia, 455
Meliaceae, 444
Melilotus, 299
Mimosa, 52
Mimoseae, 2
Minkelsia, 300
Mucuna, 300
Muellera, 304
Murraya, 415
Myrospermum, 305
Myroxylon, 306

Neptunia, 65
Nissolia, 309

Ormosia, 310
Oxalidaceae, 374
Oxalis, 376

Pachecoa, 312
Pachyrrhizus, 313
Papilionatae, 152
Parkinsonia, 143
Pelargonium, 372
Peltophorum, 143
Peltostigma, 415
Phaseolus, 316
Phyllocarpus, 144
Picramnia, 427
Piptadenia, 66
Piscidia, 335
Pisum, 337
Pithecolobium, 67
Platymiscium, 338
Poepigia, 145

Poiretia, 339
Prosopis, 85
Protium, 441
Pterocarpus, 340

Quassia, 431

Rhynchosia, 342
Ruta, 416
Rutaceae, 398

Schizolobium, 145
Schranksia, 87
Sesbania, 346
Simaba, 432
Simarouba, 432
Simaroubaceae, 425
Spartium, 347
Stigmaphyllon, 493
Stylosanthes, 348
Suriana, 434
Swartzia, 147
Sweetia, 350
Swietenia, 456

Tamarindus, 149
Tephrosia, 352
Teramnus, 357
Tetragastris, 443
Tetrapteris, 497
Tribulus, 397
Trichilia, 459
Trifolium, 358
Triphasia, 417
Tropaeolaceae, 385
Tropaeolum, 386

Vatairea, 360
Vicia, 361
Vigna, 363

Zanthoxylum, 418
Zollernia, 151
Zornia, 366
Zygophyllaceae, 393

